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It is with deep sorrow we announce the death of Edward F. Pfaff, for years advertising manager of The India Rubber World. Few men knew the rubber trade better. His loss will be keenly felt by his associates and many friends here and abroad.

The Rubber Prize Awards

THE Committee of Award appointed by the Rubber Growers' Association to decide upon the prize winners in the rubber suggestion competition has at length reported. The importance of the work, and the large amount of money involved, above $25,000, has challenged the interest of the whole world. In another column the details are given in full. Here we simply reaffirm our appreciation of the generous effort of the great rubber planters' association and congratulate the committee of experts who had the onerous task of prize selection, for their very wise and common sense handling of the whole matter. That they avoided the pitfall of novelty alone and centered upon practicability is beyond praise.

To some there will come disappointment that some hitherto unthought of use of rubber was not suggested, one that would at once utilize the big crude surplus. Such did not and could not in the nature of things occur. The really important feature is that not only 26,000 persons had an opportunity to compete but they, and other thousands thought upon rubber extension, and they will go on thinking. Thus suggestion will continue, invention be stimulated, and new and increasingly important uses for rubber surely be found.

Singapore Challenges Akron

ACCORDING to the *Straits Times*, a recent Singapore invention may possibly make the Straits city a great rubber manufacturing center. Moreover, the simplicity and cheapness of the process is said to be such that English and American rubber manufacturers will be unable to compete, and thus Singapore instead of Akron will in time be the Rubber City.

The invention covers the direct transformation of rubber latex into manufactured goods, presumably doing away with all of the steps that follow coagulation, such as washing, drying, breaking down, compounding, calendering, cutting and molding. According to the writer of the article, rubber shoe soles are ready for export 48 hours after the latex is drawn from the tree.

At first blush this seems revolutionary.

Analysis of conditions in rubber manufacture, and of trade requirements in rubber goods, however, does not bear this out.

In examining an invention its novelty is first brought into question. That there is anything new in turning latex into manufactured goods is questioned. Back in the forties both Goodyear and Hancock experimented much with latex brought in by the gallon and tried out in innumerable ways. Other early inventors also patented processes for such use but none were found of particular value. In our own day it will be recalled that Kelway Bamber, of Ceylon, produced some very interesting samples from treated latex but the commercial value was negligible.

The apparent excellence of the Straits invention is based upon a common misconception. Rubber, that is pure rubber, is of very little value in the arts. It is nearly always compounded to suit the use to which it is to be put. Speaking of soles, which were instanced in the article under discussion, the best are never made of pure rubber. Nor is this because ingredients are added primarily as cheapeners. Reclaimed rubber, fillers and fibers are put in to give added wear, to toughen, and to lessen the drawing effect of the caoutchouc. A pure gum sole has never suited the American wearer. In the eighties the late George H. Hood thoroughly tried out real pure gum rubber boots and found them not nearly as satisfactory as those made of compounded rubber. The

product heated, lacked wear, and in use was prone to tear. To successfully make wearable soles in Singapore the mixtures should be similar to those used in England and the United States. This would involve the importing of ingredients, machinery, and skilled labor, all of which may be assumed to be impracticable.

Another thought comes as to the market. England is to a degree helpless with her free trade laws but it is not so with the United States. We have a certain amount of protective tariff and it is doubtful if rubber soles from the Straits would be allowed to wipe out the American sole business secured at great cost and through years of experiment.

It would seem, also, as if it might be well for the rubber planting interests to pause before they enter into competition with their best customer. Rubber is of course a drug on the market today, but it will not always be so. Once the price is again high, American compounders could produce a better product at less cost than could the far eastern pure gum sole producer.

Moreover, the plan is a simple shifting of manufacture. It is not the development of a new market. Our friends of the pure gum sole should turn their attention to the sandal wearers of the world. Could they but supplant with rubber the hide, rope, and fiber soles on the sandals of the Chinese, Malays, Indians, Africans or Central and South American natives, the big surplus would disappear. The sole would be better than that now worn, and applied to feet that at a mustard plaster could not "draw."

The further suggestion that pneumatic tires could be made of pure gum and native fiber is visionary in the extreme. A pure gum tread or sidewall would not stand up a week, nor has any other fiber been found equal to cotton. Here, too, skilful, balanced compounding is necessary, and cotton fiber, spun, woven, and crimped to meet the most exacting requirements. Special machines, skilled labor, and great technical skill are further necessary factors.

We once predicted that Singapore would dispossess London as the world's market for crude rubber and it did. But that it will ever become a rival to the Rubber City is not apparent.

Editing the Editor

THE N. Y. B. P. A., which means the very competent Business Publishers Association, of New York, is planning a School of Industrial Journalism which is rich in promise. The course of study, outlined and prepared by the best minds in the field, covers every department of class journal production. So far as we can see, no phase of a very complicated subject is to remain untouched in the comprehensive curriculum.

The term of study lasts about eight months. While the course is at present to be given in New York City, it will undoubtedly soon be available in other great publishing centers. Editors, writers, advertising men,—all of the specialists who work in this great and growing field may now take short cuts to find out what the veterans learned slowly through mistakes and experience.

A diploma, if indeed sheepskins are to be won, should count for much in the trade paper world. And a degree, say Master of Industrial Journalism, briefed to M. I. J., would be worn with honest pride.

Ten Cent Water Bottles?

WHAT are rubber manufacturers here doing to forestall the dumping of a vast quantity of German goods on the American market at incredibly low prices? True, some representations by a few branches of the rubber trade of the need of protection have been made to the Senate committee having charge of the Fordney tariff bill, but scarcely any appeals have been made to safeguard many other important lines that are very seriously menaced by the most highly-organized and efficient competing country abroad.

How can American rubber manufacturers, who in 1920—according to official figures—paid $4.78 in wages as compared with 80 cents to $1.20 paid for the same service in Germany, hope to compete with the latter? Must they assist importers, buying the pre-war 23.8-cent mark for less than half a cent, to purchase an immense amount of cheap rubber and other goods from Germany so as to sell such wares here at an unconscionable profit?

Even were an American manufacturer of rubber water-bottles, for instance, to sell his goods at cost, what chance will he have if great department stores and mail order concerns can buy the same article from a maker in Germany for the ridiculous price of 10 cents each, with a trifling pro rata duty added? And all other rubber goods at proportionately low prices.

Rubber manufacturers owe it to themselves and their workers to insist not only on a fair measure of tariff protection but also that the valuations on imports shall be made not according to foreign or importers' standards, but on a strictly American basis.

THERE ARE, ACCORDING TO THE AMERICAN ANNUAL Golf Guide, 1,368 golf clubs in the United States. Some clubs use scarcely 5,000 balls in a year, while others easily use 30,000. One estimate gives an average of 12,000 balls to each club. At that rate the annual consumption of balls would total 16,416,000, which would indicate the use of a considerable amount of gutta percha and rubber. Indeed, to the introduction of the latter-named material may be credited the striking extension of the royal and ancient game.

The Manufacture of Hard Rubber Dust

This Product Has Become an Important Material in Making Hard Rubber Goods

By Frederic Karl

HARD rubber dust is used to such an extent that some firms find the scrap pile too small to furnish enough material for grinding and they are compelled to buy scrap outside or even to manufacture hard rubber sheet for scrap. Where formerly dust was considered a by-product, its manufacture now has become a necessary part of the hard rubber industry. Its usefulness varies from making articles direct by heavy hydraulic pressure to using it for dusting on sticky compounds. Dust made from the sweepings of the grinding room or turning departments contains foreign substances which are undesirable and hence must be removed. The process of cleaning, washing, drying and separating this dust has become an industry in itself and requires considerable apparatus as well as technical knowledge in its manufacture.

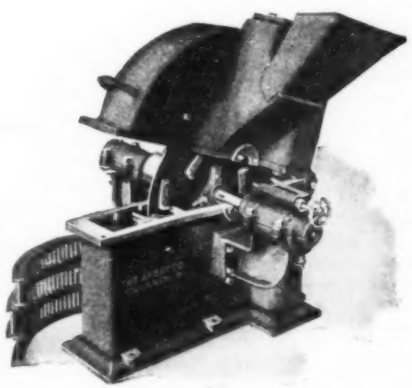

Fig. 1. Hard Rubber Cracker

Preparing Hard Rubber Dust

A succession of steps are required for the production of clean hard rubber dust from scrap as described in the following divisions:

Sorting and Cleaning

Scrap bought outside or acquired from different departments, is first sorted according to the grade of compound; running from high grade fountain pen and similar stock to the cheaper kinds as battery jar and separator scrap. Some of this scrap, especially that bought from dealers is crusted with dirt and is first soaked in water and then scrubbed with a brush by hand.

Breaking Up

Large chunks are broken with a hammer or in the case of battery jars, with an iron bar, before being fed into the cracker. The machine which is illustrated in Fig. 1, contains a set of six to ten knives which revolve inside a casing and break up the scrap into small pieces.

Grinding

The scrap next goes to the grinders shown in Fig. 2, where it is reduced to a powder between two steel rolls. These grinders have an overhead hood from which a pipe leads to an exhaust fan, drawing off the vapors or fumes which arise from the grinding. The bottom of the grinders is likewise encased so that the fine dust does not blow away. Although the rolls are cooled by water, the heat generated through the pulverizing is sometimes great enough to catch fire.

The ground material is spread out in large pans and mixed with long-handled wooden hoes, as spontaneous combustion sometimes sets the dust on fire, or heat in the dust causes vulcanization, forming large lumps or masses. After the dust is sufficiently cooled it is passed through sifters that separate it into various sizes. Some manufacturers run the dust over a magnet or separator which collects all the iron and steel particles and thus eliminates the rejections that would follow in the ultimate goods.

During the grinding process large quantities of very fine dust are produced which tests have shown will explode violently under favorable conditions. An efficient dust collecting system, such as was described in THE INDIA RUBBER WORLD, August 1, 1921, should therefore be installed in order to prevent serious accidents.

Washing

The apparatus used for washing the dust consists of a tub or vat *A*, shown in Fig. 3, in which there is a stirring arrangement *B*, plug cocks *C*, to draw off the mixture, and riffler trough *D*, consisting of three boards, set at an incline and having cross battens as shown at 1, 2, 3, 4, etc., spaced about one and one-half feet apart.

The process consists of mixing the dust with water into a creamy consistency in the tank *A*; opening the faucet *C*, allowing the liquid to run through the riffler, where the foreign substances sink and are caught by the cross pieces. The upper steps

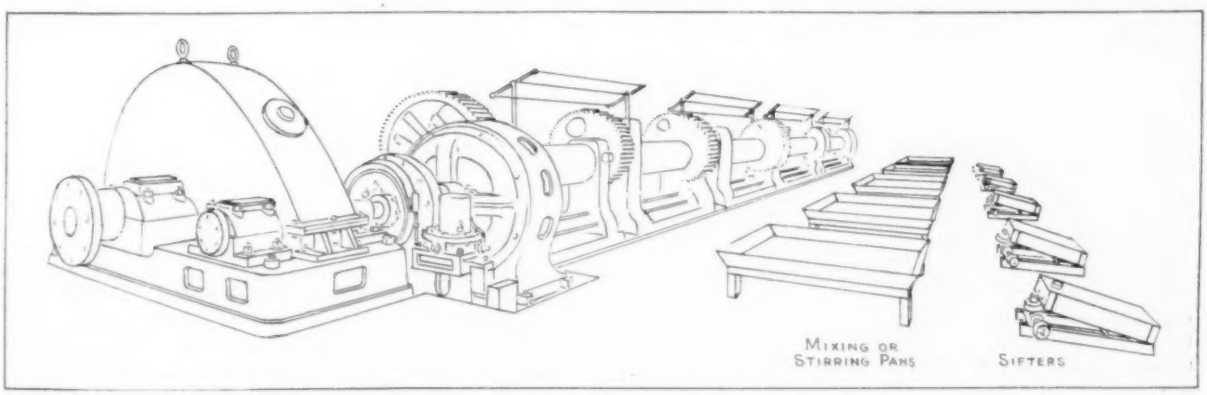

Fig. 2. Typical Hard Rubber Dust-Grinding Plant

contain most of the sand and grit, while the lower steps contain a certain amount of dust which is returned to the tank *A*.

The riffled stock runs into a wagon *E* which is equipped with filters. The water drains off into the cistern *F*, from whence it is pumped back to the tank *A* by a small pump *H* and used again.

In some German plants this process is varied somewhat by prewashing the dust as it leaves the tank. In such case an arrangement as shown in Fig. 4 is used. The mixture flows first in a box *J* through the bottom of which a pipe *K* extends about one inch. A stream of water from this pipe circulates the finer dust to the top while the grit sinks. A second and third box with gentler streams shooting upward remove the most of the sand, so that a much shorter riffler trough is required. These boxes are so arranged that the sand at the bottom can be drawn off, which saves time in cleaning the riffler. By the use of three

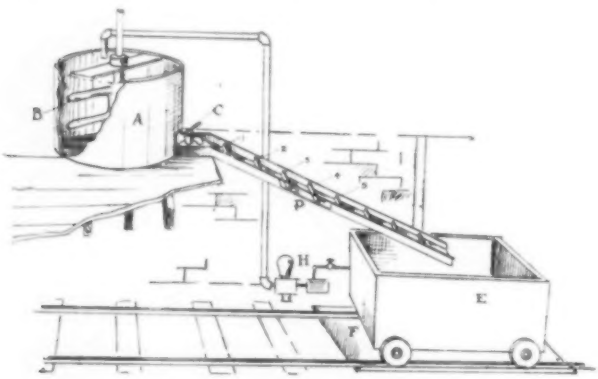

Fig. 3. Apparatus for Washing Hard Rubber Dust

or four parallel troughs, one can be cleaned while the others are being used.

Drying

The wagons containing the washed dust are next run to the dryer, which is practically a large rotary coffee-bean roaster. The dust is shovelled into the revolving steam-heated drum and comes out at the other end dry but lumpy. This is reground on mills like the ordinary mixing mill.

Sieving

The dust is then put into wagons and sent to the sifters. Any remaining large particles are removed by sieves of oscillating type. Rotary sieves have been found impractical because the

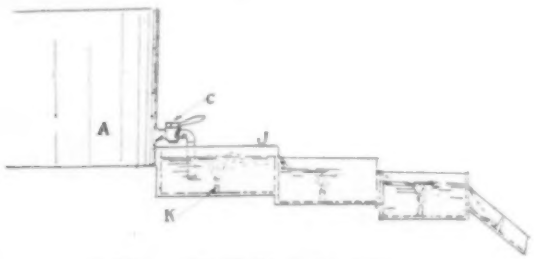

Fig. 4. Prewashing Apparatus

dust tends to build up on them like snow. From the sieves the dust is transferred to a separator which is built in front of the blower and prevents the blower from taking up too much at once.

Blowing

The blowing chamber is a room about 75 feet long and is lined throughout with sheet tin, carefully joined, and therefore air-tight. A sky-light is better than windows for this room and artificial light must be carefully installed because the dust is explosive. A suction fan or blower is located near the ceiling at one end as shown at *M*, Fig. 5. This fan draws in air through a filter from the outside past the separator *N*, where the current

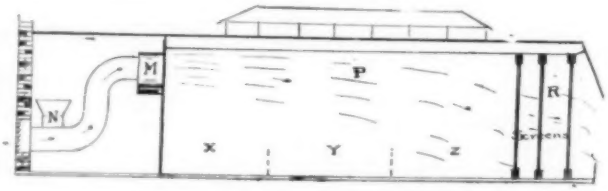

Fig. 5. Apparatus for Separating Hard Rubber Dust

picks up dust which travels along into the blowing room *P* where it settles according to its degree of fineness. The coarser grains fall at *X* while the finer dust is carried to the back of the chamber and settles at *Y* and *Z*. When the blower is stopped workmen go into the room and sweep up the dust in each division. The dust in the first division, *X*, is usually reblown.

Inasmuch as the current of air drawn in by the fan must have an exit an arrangement is provided, as shown at *R* in Fig. 5, which allows the air, but not the dust, to escape. The air outlet should be as large as possible and closed by cloth-covered screens which should be so constructed that they can be readily brushed off every day.

EXPORT STATISTICS OF AUTOMOTIVE PRODUCTS RECLASSIFIED

The Bureau of Foreign and Domestic Commerce, Washington, D. C., has prepared a new system, to become effective January 1, 1922, for classifying export statistics of automotive products. These new classifications, in more detailed divisions than heretofore, are expected to render greater service to the industry in the preparation of sales campaigns in foreign countries, or in the work of analyzing markets. Rubber products will be arranged as follows:

Commodity	Unit of Quantity
Rubber, reclaimed	Lb.
Rubber, scrap and old	Lb.
Rubber footwear:	
Boots	Pair
Shoes	Pair
Canvas shoes with rubber soles	Pair
Druggists' rubber sundries	Lb.
Hard rubber goods:	
Battery jars and accessories	Lb.
Other electrical supplies	Lb.
Other hard rubber goods	Lb.
Tires:	
Pneumatic casings—	
For automobiles	No.
Other	No.
Pneumatic tubes—	
For automobiles	No.
Other	No.
Solid tires—	
For automobiles and motor trucks	No.
Other	Lb.
Tire repair materials	Lb.
Rubber belting	Lb.
Rubber hose	Lb.
Rubber packing	Lb.
Rubber soles and heels	Lb.
Rubber thread	Lb.
Other rubber manufactures	Lb.

FOLDING PAPER BOX SUSTAINS 350-POUND WEIGHT

A new type of folding paper box, designed for inner tubes or hardware specialties, is so substantially made that it will hold up a 350-pound weight without collapsing or buckling. These boxes, which are shipped flat, are of the friction lock, two-piece telescope type, while the ends which sustain the weight are made of six thicknesses of board. The slogan of the manufacturers is: "Any kind of folding box for every kind of business."—Peerless Paper Box Manufacturing Co., 1137 West 6th street, Cleveland, Ohio.

A Glossary of Words and Terms Used in the Rubber Industry—X[1]

By Henry C. Pearson

Pneumatic Tire Definitions[2]

SAFETY PRESSURE MARGIN. The utmost latitude allowable in decrease of tire air pressure; should not exceed a fifth—20 per cent—of full pressure as indicated by standard inflation scale.

SALVAGED STOCK. Rubber and fabric factory scrap or from worn or damaged tires, separated, and graded for reuse or for reclaiming.

SAND BAG. A stout canvas tubular sack filled with sand, closed at either end, and used, under clamps, inside a casing to give uniform pressure in retreading or repairing.

SAND BOILS. Blisters or swellings caused by road material working in between tread and carcass.

SEAMED TUBES. Inner tubes formed by applying a strip of tube stock lengthwise about a metal tube or mandrel and cementing the edges together.

SECOND VULCANIZING. Final curing of the semi-vulcanized, built-up carcass after the breaker strip and the tread have been added. See Double Cure.

SECONDS. Tires and tubes in which defects develop during construction. See N. F. C.

SECTION DIAMETER. The distance in inches from the surface of the tread to a point midway between the beads of a tire.

SECTIONAL REENFORCEMENT. Additional support given a weakened casing by vulcanizing to the inside one or more layers of frictioned fabric.

SECTIONAL REPAIR. Entire removal of old material and replacement with new stock in any of three defined sections as measured across the outer side of a casing, side, tread, and full section. See Repair.

SECURITY BOLTS. See Tire Bolts.

SELF-CURING CEMENT. See Air Cure Cement.

SELF-HEALING TUBES. Inner tubes so constructed that the contained compressed air automatically closes a rent or puncture made in its wall. See Puncture Proof Tubes.

SELF-VULCANIZING PATCH. See Patch.

SHEARING. A sliding tendency or sidewise strain between plies and between tread and cushion due to excess flexing in a tire, and inducing separation of casing materials. See Flexing.

SHEETING. A light, square-woven cotton fabric much used for bandaging and taping tires for open curing.

SHOE. See Casing.

SHOE LINERS. Several layers of frictioned fabric with a heavy coating of rubber on one side to be applied to the inner side of the damaged casing.

SHORT STAPLE FABRIC. A weave of common domestic or Egyptian short-fiber cotton.

SHRUNKEN BEAD. A repair trouble whereby a tire bead curls or shrivels from proper shape while being cured.

SIDE SECTION. Cutting out a part of one sidewall and fabric beneath, usually to repair rim cuts, holes in sidewall, etc.

SIDE STRIP. A narrow, relatively long piece of compounded sheet rubber used for the sidewalls of a casing.

SIDEWALL CUTS. Incisions in a tire casing between the bead and tread, usually caused by scraping against a curbstone, striking a sharp object a glancing blow, running in street-car tracks, through cut-up or frozen roads, or in deep sand, especially while a tire is underinflated and excess flexing occurs.

SIDEWALL STOCK. A heavy rubber strip on either side of a tire, extending from the tread undercover to the bead base, and designed to strengthen the sides of the casing, and protect it from moisture.

SILVERTOWN CORD TIRES. See Cord and Cable Cord Tires.

SINGLE CLINCH. A type of double-tube bicycle tire, the casing of which is fastened to the rim by springing or clinching the heel of the bead under the inturned flanges on the edges of the rim.

SINGLE CURE. The vulcanizing of a tire at one operation.

SINGLE TUBE TIRE. The original bicycle or "hose-pipe" tire, of several layers of rubberized fabric, lined and coated with rubber.

SIZE. The proportions of a pneumatic tire, determined in the case of double-tube tires by casing measurements, the larger figure in the indicated size giving the total height or diameter, from road surface to top of tread; and the smaller figure the maximum inside cross-section, or diameter of the casing.

AUTOMOBILE TIRE SIZES. The various dimensions in which tires have been or are now being manufactured, and including the following in double-tube fabric and cord tires:

Automobile Tire Sizes

Inch measure of casings	Metric equivalent (approximate)	Inch measure of casings	Metric equivalent (approximate)	Inch measure of casings	Metric equivalent (approximate)
22 x 2½	550 x 65	31 x 4	775 x 105	36 x 6	920 x 150
24 x 1½	600 x 40	32 x 3*	800 x 85	37 x 4*	935 x 120
26 x 2¼	650 x 65	32 x 3½	810 x 90	37 x 4½†	935 x 120
26 x 2½	650 x 65	32 x 4	815 x 105	37 x 5	935 x 125
26 x 3	650 x 85	32 x 4½	815 x 120	37 x 5½*	935 x 135
28 x 1½	700 x 50	33 x 3½	835 x 90	37 x 6	935 x 150
28 x 1¾	700 x 55	33 x 4	835 x 105	38 x 3½	960 x 90
28 x 2	700 x 60	33 x 4½	835 x 120	38 x 4½*	960 x 120
28 x 2¼	700 x 65	33 x 5	835 x 135	38 x 5½†	960 x 135
28 x 2½	700 x 65	34 x 3	860 x 85	38 x 6*	960 x 150
28 x 2¾	700 x 70	34 x 3½	870 x 90	38 x 7	960 x 175
28 x 3	700 x 85	34 x 4	875 x 105	39 x 5	980 x 125
28 x 3½	710 x 90	34 x 4½	880 x 120	40 x 3½	1000 x 90
28 x 4	710 x 105	34 x 5	880 x 125	40 x 4*	1000 x 120
29 x 2¾	730 x 70	34 x 5½†	880 x 135	40 x 4½*	1000 x 120
29 x 3	730 x 80	35 x 4†	895 x 105	40 x 6	1000 x 150
29 x 3½	730 x 85	35 x 4½	895 x 120	40 x 8	1000 x 210
30 x 2½	750 x 65	35 x 5	895 x 135	41 x 4½*	1040 x 120
30 x 3	760 x 85	35 x 6	895 x 150	42 x 4*	1080 x 120
30 x 3½	760 x 90	36 x 3½†	915 x 90	42 x 4½	1080 x 125
30 x 4†	765 x 105	36 x 4†	915 x 105	42 x 6	1080 x 150
30 x 4½	760 x 120	36 x 4½	920 x 120	42 x 9*	1080 x 240
31 x 3½†	775 x 90	36 x 5†	920 x 135	44 x 10	1100 x 250
31 x 3¾	775 x 95	36 x 5½†	920 x 135		

*Occasional (odd) sizes. †Unusual sizes.

NOTE.—The above millimeter sizes represent old overall branding.

S. A. E. Standard Sizes and Metric Equivalents

Nominal Tire and Rim Size		Oversize Tire Size		Tire Seat Diam. (at Rim)		Tire Seat Circum. (Rim) Inches, ±0.046
Inch	Mm	Inch	Mm.	Inch	Mm.	
30 x 3½	90/585	31 x 4	105/585	23	585	72.257
32 x 3½	90x635	33 x 4	105/635	25	635	78.540
32 x 4	105/610	33 x 4½	120/610	24	610	75.398
33 x 4	105/635	34 x 4½	120/635	25	635	78.540
32 x 4½	120/585	33 x 5	135/585	23	585	72.257
33 x 4½	120/610	34 x 5	135/610	24	610	75.398
34 x 4½	120/635	35 x 5	135/635	25	635	78.540
34 x 5	135/610	36 x 6	150/610	24	610	75.398
36 x 6	150/610	38 x 7	175/610	24	610	75.398
38 x 7	175/610	40 x 8	200/610	24	610	75.398
40 x 8	200/610	42 x 9	225/610	24	610	75.398
44 x 10	250/610	.....	.....	24	610	75.398

NOTES.—Pneumatic tires for passenger cars and motor trucks shall be of the straightside type in all sizes except the 30 by 3½-inch regular and 31 by 4-inch oversize, where only regular clincher type shall be used.

In inch nomenclature, the nominal tire diameter equals the tire-seat diameter plus twice the tire cross-section diameter. Sizes are designated by giving the outside diameter of the tire and the tire-section diameter, as 30 by 3½.

In metric nomenclature, the nominal diameter equals the tire-seat diameter. Sizes are designated by giving the tire cross-section diameter and the tire-seat diameter, as "90 for 585," but are branded as "90/585."

Manufacturers should use the nominal tire and rim sizes for original equipment, thus permitting the oversize equipment to be used by the consumer.

[1]Continued from THE INDIA RUBBER WORLD, November 1, 1921, pages 93-95.

Proposed S. A. E. Tire and Rim Recommended Practice*

Rim Size Inches	Tire Size Type	Tire Size Regular Inches	Tire Size Oversize Inches	Tire Seat Diameter Inches
30 x 3½	C	30 x 3½	32 x 4	23
30 x 3½	SS	.....	31 x 4	23
32 x 4	SS	32 x 4	33 x 4½	24
32 x 4½	SS	32 x 4½	33 x 5	23
34 x 4½	SS	34 x 4½	35 x 5	25
34 x 5	SS	34 x 5	36 x 6	24
36 x 6	SS	36 x 6	38 x 7	24
38 x 7	SS	38 x 7	40 x 8	24
40 x 8	SS	40 x 8	42 x 9	24
44 x 10	SS	44 x 10	.....	24

*Approved by the Tire Division of The Rubber Association of America, Inc.

Motorcycle Tire Sizes

Inches	Inches	Inches
22 x 2½	28 x 1¾	28 x 3
24 x 1½	28 x 2	29 x 2¾
26 x 2¼	28 x 2¼	29 x 3
26 x 2½	28 x 2½	29 x 3½
28 x 1⅜	28 x 2¾	.....

Motorcycle Racing Sizes

28 x 1¾	28 x 2	28 x 2¼

Airplane Tire Sizes

20 x 2	20 x 2½	26 x 4
20 x 2¼	26 x 3	26 x 5

Bicycle Tire Sizes—Single Tube

Juvenile	Juvenile	Adult
14 x 1½	24 x 1½	28 x 1⅛
16 x 1½	26 x 1¼	28 x 1¼
18 x 1½	26 x 1⅜	28 x 1⅜
20 x 1⅜	26 x 1½	28 x 1½
20 x 1½	26 x 1⅝	28 x 1⅝
24 x 1⅜	26 x 1¾	28 x 1¾

European Automobile Tire Sizes. Pneumatic tires that are most generally used in Europe have the following dimensions; usually approximate:

Sizes in Millimeters: Interior Diameter	Sizes in Millimeters: Section Diameter	Equivalent in Inches: Interior Diameter	Equivalent in Inches: Section Diameter
710	90	27.95	3.54
760	90	29.92	3.54
810	90	31.89	3.54
870	90	34.25	3.54
910	90	35.83	3.54
765	105	30.12	4.13
815	105	32.09	4.13
875	105	34.45	4.13
915	105	36.02	4.13
820	120	32.28	4.72
880	120	34.65	4.72
930	120	36.22	4.72
895	135	35.24	5.32
935	135	36.81	5.32

Interchangeable Automobile Tire Sizes. Tires of such extra dimension, as shown in cross-section and overall external diameter, as will allow them to be used for larger loads without change of standard minimum rims, as:

Size Inches	Fits Rim, Inches	Size, Inches	Fits Rim, Inches	Size, Inches	Fits Rim, Inches
29 x 3½	28 x 3	35 x 4	34 x 3½	37 x 5½	36 x 5
31 x 3½	30 x 3	35 x 4½	34 x 4	38 x 6	37 x 5½
31 x 4	30 x 3½	35 x 5	34 x 4½	39 x 5	38 x 4½
33 x 3½	32 x 3	37 x 4	36 x 3½	41 x 4½	40 x 4
33 x 4	32 x 3½	37 x 4½	36 x 4	41 x 5	40 x 4½
33 x 4½	32 x 4	37 x 5	36 x 4½	.....	.....

See Oversize Tire.

Regular and Oversize Scale. A table giving the comparative dimensions of various casings, as:

Regular	Oversize	Regular	Oversize
28 x 3	29 x 3½	32 x 4½	33 x 5
30 x 3	31 x 3½	34 x 4	35 x 4½
30 x 3½	31 x 4	34 x 4½	35 x 5
32 x 3	33 x 3½	36 x 4	37 x 4½
32 x 3½	33 x 4	36 x 4½	37 x 5
32 x 4	33 x 4½	36 x 5	37 x 5½

SKIDDING. Wheel sliding without rotation; a combination forward movement of a car with a side slip of a tire.

SKIM COAT. A thin rubber surfacing of one or both sides of frictioned fabric.

SKIP. A failure of parts or plies to unite one with another in curing.

SKIVE. To shave or pare the edges of rubber or rubberized fabrics; to feather-edge.

SLEEVE. A short, curved section of rubberized cotton duck in several plies, often put inside a casing in emergency repair, or to safeguard a tube in a weakened casing.

SLOW LEAKS. An inner-tube trouble often due to a valve gasket being misplaced, or to loosening of a patch.

SMOOTH TREAD. See Plain Tread.

SOAPING. Treating a molding surface with soap solution to prevent adhesion during vulcanization.

SOFT BEAD TIRES. See Clincher Tires.

SOFT CLINCHER BEAD. A bead with a nub-shaped heel and a soft stretchable rubber core allowing a tire to be easily pried on or off a clincher rim.

SOLID PNEUMATIC TIRE. A tire consisting of inner tube and carcass held within a high-sided clincher rim, with a tread consisting of a solid rubber tire vulcanized in place.

SOLING. See Retreading.

SOLUTION. A liquid, usually of raw gum or compounded rubber with benzol, naphtha, or other solvent, used as a tire cement.

SORTING. Inspecting and separating worn or damaged tires according to quality and condition, as repairable, unrepairable, worth stripping, etc.

SPARE TIRE. An extra tire often carried on a motor car, separate or mounted on a rim or wheel, and usually inflated, for emergency use.

SPECIFICATION. A detailed statement of requirements in manufacture embodying an explicit description of size, materials, qualities, etc.; usually particularized to conform to a standard product, and referring in this instance to Tires, Inner Tubes, Rims and Repair Material. The special points covered by the United States Army, for example, are:

Tires. The varying amount of new rubber used in the making of parts of a tire casing, the minimum percentage volume for a fabric casing being set at: for tread 65, sidewall 65, friction 75; for cord casings, tread 70, sidewall 65, friction and cushion 85.

Inner Tubes. A minimum percentage rubber volume of 93.

Acid Solution. Must be composed of 2 per cent sulphur-monochloride and 98 per cent benzol.

Cement, Acid Cure. Minimum requirement of new rubber, 6 per cent of total weight.

Cement, Vulcanizing. Minimum percentage of new rubber for tire and tube repair, 75.

Fabrics:

Airplane Tire Fabric. Two or more cord plies of long-staple cotton laid diagonally to one another and cords and plies well insulated in rubber.

Bead Fabric. Must weigh at least 8 ounces per square yard, be of long staple cotton, square woven, and frictioned on both sides.

Blowout Patches. Must have at least 6 plies of 7 ounce fabric.

Cord Builder Fabric. Must be of long-staple carded Egyptian or combed peeler cotton of not less than 13 nor over 16 ounces per square yard, frictioned or spread on both sides, and skim-coated equally on both sides to a gage of 0.050-inch.

Fabric Cord Patches. Must be of carded Egyptian, combed peeler cotton, or equivalent, weighing not less than 13 nor more than 16 ounces to the square yard.

Square-Woven Building Fabric. Must be 17¼ ounces per square yard with a 3 per cent plus or minus allowance; 23 by 23 weave; of long-staple cotton with a tensile strength of at least 150 pounds per inch for warp and filling; and frictioned both sides and skim-coated one side to a minimum of 0.047-inch.

Friction Strength—Casings. Minimum requirements for fabric casings are: between fabric plies 16 pounds, between breaker and tread 28 pounds, between breaker and cushion 28 pounds, between cushion and carcass 16 pounds, between

sidewall and carcass 10 pounds, for cord casings, between breaker and tread 32 pounds, between breaker and cushion 32 pounds, between sidewall and plies 14 pounds, between cushion and plies 16 pounds.

Reclaimed Rubber. 15 per cent maximum allowed in motorcycle casings.

Repair Kits. Must include six cementless patches, strip of cured-back gum 2 by 8 inches, tube of cement 2½ by ½ inch diameter, sandpaper 2 by 8 inches, two valve insides, Schrader's 1801 or equivalent, and two valve caps, Schrader's 880, or equivalent.

Rims. For airplanes, clincher type; motorcycles, clincher type; for automobiles, clincher types in 30 by 3½ regular and 31 by 4 oversize, and straightside type for larger sizes.

Rubber. Best quality wild or plantation rubber.

Solvents. Benzol, carbon disulphide, and carbon tetrachloride specified.

Substitutes. None allowed.

Tests. See Tests.

SPLICED TUBE. A vulcanized tube the ends of which are lapped, cemented together and cold-cured at the union, the valve being also cemented in and the valve patch and pad cold cured.

SPLICING. In inner-tube making and repairing, cementing and joining the buffed ends of a tube together, whereby one end is inserted about 2½ inches into the other end, and cold-curing the lapped seam thus formed. As applied to carcass building, the overlapping of the ends of a strip of builder fabric on a core.

SPREAD STOCK. Fabric to which rubber in a solvent is applied with a spreading machine, the material being poured upon the upper surface of the fabric as it passes between a roll and a knife which scrapes off the excess, after which the volatile solvent is evaporated, leaving a thin coat of rubber on the fabric. The process is usually repeated several times to insure a thorough coating.

STANDARD COMMERCIAL PRACTICE. Average and usual excellence of product, process, or dealing. Called also Manufacturers' Standard Practice, and Commercial Practice.

STANDARD MAKE. A trade term applied to tires of responsible manufacturers, and conforming to the best requirements as to size, quality, etc.

STANDARD TIRES. See Regular Sizes.

STAPLE RENEWAL. Insertion of new staples in bead of a Silvertown quick-detachable cord tire.

STEAM BAG. A bag constructed like an air bag to be inserted in a casing in vulcanizing repair work, and with valves at either end to allow circulation; also made to allow use of air.

STEEL-STUDDED LEATHER TREAD. A tire tread of leather affixed to a rubber-canvas casing and designed for rough service and as a non-skid.

STEEL-STUDDED RUBBER HOOK-ON BOOT. An outside repair boot with the tread reinforced with rows of steel studs. See Boot.

STEPPING-OUT. Cutting out fabric plies in oblong sections with each layer forming a step. A repair term.

STIFFENING STRIPS. Long, narrow pieces of frictioned fabric used for protecting the inner side of a cord tire and covering the staples—in the Silvertown type—about which the cords are looped.

STITCHED FABRIC TIRE. A fabric casing in which the plies are stitched together to prevent separation, decrease interchafing, and to lessen blowout liability.

STITCHING. Rolling the edges of gum or fabric strips with a serrated wheel to aid adhesion.

STOCKINET. An elastic knitted cotton textile often used as a lining for flaps to lessen tube friction; also used as an inner lining on some plain blowout patches; also used in cord tire adhesive casing patches.

STONE BRUISE. Fracture of carcass fabric due to striking a stone or similar object.

STRAIGHT BEAD. See Straightside.

STRAIGHTSIDE BEAD. A bead fitting a rim without an incurved flange, and having a hard rubber core, often with a reenforcement of piano wire strands; used on rims with detachable side rings.

STRAIGHTSIDE TIRE. A tire having the outer edge of its bead straight and fitting a rim without an incurved flange.

STRAP-ON-BOOT. See Boot.

STRIPPED TIRES. See Road-Worn.

STUDDED TREAD. A tread having on its surface metal or disks to add to wear or prevent puncture.

SUCTION TREAD. The vacuum principle employed in the design and construction of non-skid tires, the treads of which contain a series of depressions which, under pressure in road contact, form "suckers" which produce more or less exhaustion of air between portions of the under surface of the tread, giving the latter increased grip and traction and minimizing slipping tendency.

SUNDRIES, TIRE. Rubber or rubber and fabric parts or accessories used in applying, using, or repairing tires.

SUPERSIZE TIRE. A tire made extra large in cross-section and external diameter and designed for small-size clincher rims. It is branded with the actual rim size and the clincher size.

SURFACE CUTS. Incisions or deep abrasions in tire treads.

SURFACE GLAZING. A manufacturing defect in the outside of a tire, due to excess dry heat in curing; generally indicated by a glassy appearance of the casing exterior.

SURFACE LINER. A strip of bias-cut muslin stretched over a tire that is open cured to give a smooth surface to side wall and tread.

SURPLUS STOCKS. Goods produced in excess of market requirements. Often a seller's term for seconds. See N. F. C.

JUDICIAL DECISIONS

EDWARD MAURER CO. VS. TUBELESS TIRE CO., United States District Court of Ohio.

Contracts for the sale of crude rubber made during war time, when government regulations respecting importation and sale of rubber were anticipated, contained a provision that "this contract is subject to all the rules and regulations imposed by the United States Government." Held that, where such regulations were made, which rendered performance by either party impossible at the times fixed for deliveries, the effect was not merely to suspend the contracts, but that both parties were discharged from any obligation thereunder, and that neither could demand or enforce delivery after such regulations were withdrawn.—*Federal Reporter*, Volume 272, page 990.

TRADE CONDITIONS IN EUROPE—A FEW OBSERVATIONS

Some interesting observations in regard to foreign industrial conditions have been made, on his return from a short European trip, by Walter Edward Myers, president of the Denman-Myers Cord Tire Co., Cleveland, Ohio.

In Mr. Myers' opinion France, Belgium and England, while still in a most distressed condition, are trying to resume their place in the industries, while the peoples of these countries are all courageously working and striving towards recovery. He thinks that a proper equalization of prices will stabilize the rubber industry, but that leadership is also requisite in order to bring about these desired conditions. In his opinion two very necessary and outstanding things confront the rubber industry of today. These are: adequate facilities for financing; adequate markets for sale of products.

That the problems thus stated will finally be solved, no one in the rubber industry should doubt, while as for financial conditions in general, "the world, in spite of the disaster and havoc wrought by the war, was never better to live in than it is today."

A Better Standard of Tire Repairing[1]

By Roy R. Reid[2]

Repairing Surface or Tread Cuts

SMALL cuts in pneumatic tire treads allow water and sand to penetrate the tread rubber and fabric and cause decay, separation of plies and blowouts. It is cheaper to repair them at the start, and will save annoyance to the motorist later on.

Bevel the edges of the cut, buff off the surface clean, apply two coats of cement, one light and one heavy, and allow each to dry thoroughly. Apply one sheet of 1/32-inch cushion gum, then fill in with tread gum. Skive or buff off, smooth and cure in the spot patch mold, section or retread mold, as the case may be.

Repairing Fabric Breaks or Cuts

Fabric breaks going through not more than two plies may be repaired by the inside method of applying two or more plies of fabric and curing on the inside vulcanizer. Allow the widest ply of fabric to extend from bead to bead and about four inches beyond each end of the check or break. The other plies should be one inch narrower all around.

First clean the tire inside, washing off the bloom, and buff about five inches beyond each end of the break, from bead to bead. Clean the inside of the casing and apply at least two coats of cement, the first coat light, the second, heavy. If the nature of the cement requires more than two coats, apply a light third coat. Allow the first coat to dry thirty minutes, the second coat one hour, and the last from three to five hours.

If old fabric is used, skive the edges so they will make a smooth job and not chafe the tube.

Fill up the break with cushion gum and run a layer of cushion, about ½-inch wide, around the edge of the break. Stitch in the shoe or plies, beginning with the narrowest, and cure on the inside vulcanizer or in the section mold.

Repairing Rim Cuts

When a tire is rim cut for a distance which would mean not over two cures in the section mold, it is worth while to repair it. However, if it shows it is about ready to give way in other parts, it is useless to make the repair, as the mileage obtained would not justify the cost.

The same method of stepping out is employed as that explained for the outside method of repairing blowouts, except that the plies are removed only from the bead to the edge of the tread, and a safe margin is left for laps.

When ready to build up, replace with new fabric the same as removed, except that one or two plies—according to the size of the tire—should extend over the toe of the bead and near the center of the tread on the inside of the casing. If two plies only are removed, in replacing them stop one at the toe of the bead and the other at the center of the tread. Stopping plies in the center of the tread prevents hinging and consequent failure of the repair.

It is always best to use regular fabric in repairing rim cuts in cord tires, as the fabric acts as an anchor strip. Under no condition, however, is regular fabric recommended in repairing blowouts except as an anchor strip.

Example of Tread-Worn Tire Before and After Being Retreaded in Non-Skid Molds

Making an Impression Pad

It is often the case in curing the section that part of the tread is so far gone that it must be built up from new rubber and yet the anti-skid designs are so preserved on the rest of the tire that to make a neat-looking job it is necessary to reproduce the designs on the part repaired. This is done by the means of an impression pad that can easily be made by any repairman in the following manner:

Take one ply of bead fabric or regular fabric, a little longer than the length of the section mold, and about two inches wider than the tread of the tire. Build this up with one sheet of 1/16-inch rubber. If the designs are pretty well worn, use two sheets. If they are much worn where the pad will come in contact with the outer edges, build in narrow strips of rubber on top of this to make as near as possible the reverse pattern of the tread. Soapstone the pad well and place it in the section mold. Put the air bag in the good part of the tire and place it in the section mold, the same as if it were a section and cure about 20 minutes.

Remove the casing and pad, which will provide a reverse pattern of the tread design, that can be placed over the section job and will reproduce the design in the raw rubber while it is curing. Before placing the pad over the raw stock, soapstone the tread and the pad freely to prevent sticking. Cement the edges of the pad with quick-curing cement to hold it in place until it is adjusted in the section mold.

Preserve all pads made, as they may be used again and again on the same patterns and same sizes of tires. This is an economy that is well worth while.

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[1]Continued from THE INDIA RUBBER WORLD, November 1, 1921, pages 109-111.

[2]Western Rubber Mold Co., 243, 321-323 North Crawford avenue, Chicago, Illinois.

Repairing Punctures, Cuts and Blowouts in Tubes

Make inside repairs of punctures, cuts, and blowouts, thus: If the hole has a ragged edge, trim smooth. If it is a straight cut, trim a little around the hole at each end. Roughen around the break with sand or emery paper. Put about one-half teaspoonful of soapstone in the tube and shake to the opposite end. Wash all bloom from the inside of the tube for at least an inch around the injury with a piece of cloth or muslin dampened with gasoline. Apply a coat of quick-cure cement to the cleaned surfaces inside and out and allow it to dry thoroughly.

Using the Flexible Shaft Buffer

Cut a piece of combination tube gum ¾-inch larger all around than the hole. Pick it up with a pair of tweezers, uncured side up, and dip in gasoline. Force it through the hole and hold it in position until the gasoline evaporates, then press firmly against the cement. Cut small strips of outside tube gum and fill up the hole, running a strip over the edge, about ¼-inch and a little higher than the level of the tube. Shake the tube until the soapstone comes to the spot back of the repair to prevent the gum sticking to the other side.

Cure on the tube plate according to the recommended cure for the stock used. Remove and pull the sides of the tube apart while the repair is still hot. Cool it in water before using.

If the blowout is very close to the valve stem, it may be necessary to remove the stem in order to make the patch. Do this by removing all the fittings and forcing the stem back inside the tube. If the tube has an outside valve base, remove and replace with cold cement. This valve base can usually be removed easily by heating a little on the tube plate.

If the tube leaks around the valve stem in such a manner as to make a repair difficult, remove the valve stem and base as explained above and repair the valve hole as if it were an ordinary blowout. Cut a small hole in another part of the tube and force the valve stem out through it. Apply a new valve base with cold cement and reapply the fittings. If no ready-made valve bases are at hand, make one out of a ply of thin fabric and rubber.

If a puncture is very small such as that made by a pin or tack, it can be repaired by placing two plies of outside gum over the puncture, the tube having first been cleaned and cemented. Cure in the usual manner.

Splicing Tubes

There are tube mandrels which can be purchased to assist in making splices, but the following method can be worked very satisfactorily and without the use of acid which requires very fast work to accomplish results.

To splice a tube or put in a section, allow about two and one-half inches at each end for lap. Clean one end on its outside surface for a distance of two and one-half inches. Take the other end of the splice and double back for two and one-half inches. Clean the exposed surface. Cement each part thoroughly and allow to dry. Take hold of both ends of the splice, being careful that the tube is not twisted. Place the end that is doubled back, just over the other end of the splice which should first be dipped in gasoline, and roll the doubled end over the other, so that the cemented surfaces come together. Work until the splice is smooth and the gasoline dry. Taper the exposed end with a knife or emery, cement and cover with a strip of outside tube gum. Cure on a tube plate by making three cures with a block wide enough to cover all of the tube except the edges.

Rebuilding or Retreading

No other branch of the tire repair industry has been "murdered" so consistently as retreading, and for this reason many vulcanizers, although experienced in sectional repairs, do not believe that retreading pays.

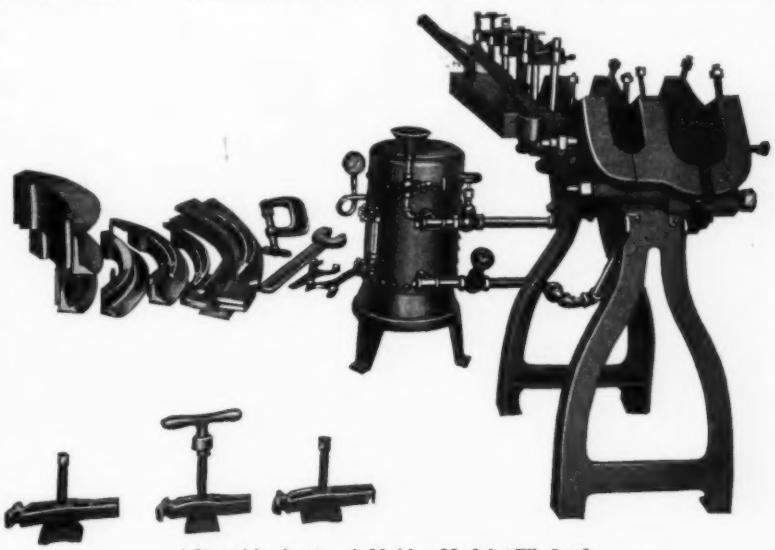
It is a fact, however, that when a tire which has a sound carcass in every respect is rebuilt in the proper manner and cured under proper conditions and pressure with good materials, the tire can be made to give within a very close percentage of its original mileage.

The most essential part of rebuilding a tire is to be able to judge or draw a very fine distinction between those tires suitable for rebuilding and those which should be junked, and here is where the man experienced in sectional vulcanizing usually meets failure in retreading.

When the retreading business was first introduced to the motorist, it was received with such confidence that the repair man was able to retread any and every tire that came into his shop and get away with it, but rarely, if ever, was he able to do another job for the same man.

After being sure that the casing is free from any defects or weakness that would make the repair doubtful, it is then necessary to remove the tread and breaker, going beyond the edges of the breaker strip, or farther, to include any of the tread that may be loose, and then after cutting the tire to the fabric on each side, peeling or skiving the tread off to the fabric proper.

Fabric tires can usually be peeled after cutting at the edges, but it is necessary to skive the tread from cord tires to prevent lifting the old plies of cord.



Adjustable Sectional Molds—Model "E" Outfit

Clean the surface well by buffing with a wire brush, and beveling each sidewall where the lap is to come so as to get contact between the new and old rubber. Be sure that the tire is thoroughly dry and free from oil or grease where any cement must be applied, then give it three coats of cement, as explained in repairing blowouts, allowing the cement to go well down on the bevel surface of the sidewall.

Combination Tread Roller—Tread Peeler and Tread Applier—Peeling Off the Old Tread

In building up a tire the most modern method is to use either camelback or breaker and cushion stock, separate or all in one, as the tire companies are furnishing it today. If the cushion, breaker and camelback are applied separately, be sure that the stock fills out sufficiently to make a neat lap, and if it is somewhat narrow add extra cushion gum and sheet stock to make up for the deficiency, skiving off all excess rubber so that it is not necessary for the raw rubber to flow in either direction where the lap comes.

Too much care cannot be exercised in getting a neat joint before the tire goes into the mold for it will save "doctoring" and recuring afterwards. If material of the same color as originally used on the tire is applied, it is possible to get a joint that will defy detection.

The best results in retreading are obtained by using the third-circle type of dry cure retreader, as two or three molds only are necessary for all sizes of tires. Sufficient pressure can be obtained and there is no chance of "buckling" the fabric, as in the single-cure type.

Never use a reliner in an attempt to make a retread give sufficient mileage, unless this reliner is used merely to strengthen a fabric that is barely checked. A tire cannot be made out of a reliner, and if the casing is in good sound condition, it will give more mileage without a reliner than with one.

Tips to Tire Men

Be sure the repair decided upon is going to give satisfactory service for the price it is necessary to charge to make a profit.

It is better to send the customer away without getting any money from him when the tire is not worth repairing than it is to make a dissatisfied customer who is always a poor advertisement. Better still, when his casing is beyond repair, be ready with a substitute to take its place.

Never substitute one casing for another without the customer's knowledge and sanction—it will be detrimental at one time or another.

Always give a customer the benefit of the doubt. It is better to make a policy adjustment and retain a customer, for it is the best and cheapest advertising you can get.

If a casing is repaired or retreaded for a customer do not lay the blame to his treatment of the tire, if he returns it for an adjustment, unless he was given full information about the care of the tire when he purchased it.

Do not forget that there should be no moisture in any part of the repair before it goes into the mold. This means that it is necessary to keep perspiring hands off cemented parts of the casing before the stock is applied, and that when using gasoline to clean the surface the solvent is allowed to dry thoroughly before the stock is applied.

Do not forget to test the solvent occasionally, even though it is guaranteed above 72 degrees test.

Do not try to rush a job by using a first coat of cement any heavier than the casing will absorb.

The solvent used in cement is no more than a carrier to convey the cement into the pores of the fabric, and the thinner the solvent the better the cohesion obtained. This applies to the first coat especially. The second and third coats must each be heavier.

Do not attempt to set a certain drying time for cement. Atmospheric conditions require it to dry longer some times than others. Learn to determine when the cement is sufficiently dry by touching it with the finger tips.

Do not be afraid to use a little more cushion gum, especially around the injury and over the fabric steps—it will insure a better splice and union. Always lap fabric at least ⅛ of an inch and cord ¾ of an inch, over the step.

Be sure to stitch the fabric thoroughly to remove the stretch—simply rolling it with the flat roller is not sufficient to do this.

Cushion the exposed edges of any reenforced patch to insure a closer union and prevent the tube from chafing.

In using a reliner be sure to apply and cure it properly, otherwise it will loosen and create friction which will eventually cause a blowout. A reliner vulcanized is an integral part of the casing.

All tread stock, camelback, breaker strip, etc., should be applied and rolled down from the center outwards, thus trapping as little air as possible, and all air bubbles should thereafter be pricked.

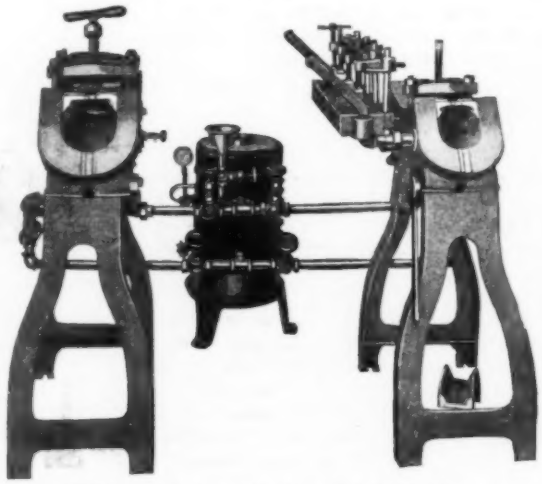
Keep all dirt and soapstone away from any joint and from underneath the stock.

The utmost care should be taken in applying stock where the union comes with the old rubber to see that it is not built higher and that it is skived off so that there is no tendency of the stock to flow beyond the cemented part. A little precaution and extra work at this time will prevent unnecessary trouble after the tire comes out of the mold.

Never start or stop a ply of fabric at the flexing point of the tire, as the edge of the fabric has a tendency to cut through the plies underneath, caused by the constant motion at this part of the tire.

There are three places to stop off fabric: at the bead, in the center of the side wall if the injury is elsewhere, and in the center of the tread when the injury is at the bead or in the side wall.

In repairing a blowout by the outside method, if the tread is in good condition it is not necessary to throw it away and use new camelback, but it is better to remove the tread entirely by cutting it at each end of the repair, laying it aside and applying it after the injury is built up, as it prevents collecting air under the tread at the point where it is bent back.



Model "H" Adjustable Sectional Mold Outfit

Bevel the edges where joints are made—it will insure a perfect union. Too long a bevel, however, is not advisable.

Always use new fabric in making an outside sectional repair and in replacing fabric that is removed.

Reliner and reenforcement patches on the interior of a tire may be pulled from an old tire if the fabric shows itself to be in good condition, but to attempt to peel the plies apart, buff, and cement them, would cost more in the end than new fabric and will not insure a serviceable job.

Watch the air bags. Make sure that they fit the casing and the casing fits the mold.

The latest type of mold on the market eliminates any difficulty formerly encountered in curing a tire in a mold too large or too small for it, as it can be perfectly adjusted to fit any size tire, whether cord or fabric, but under any circumstances, it must be seen that the air bag perfectly fits the tire without having to be expanded or deflated. If it is too small, pad it out. If too large, use a smaller bag.

Always take care to see that the bead plates are seated properly. Nothing so exasperates a customer as a sectional job with a bead so much larger than the rest of the tire that it is practically impossible to mount it. Do not seat the bead plates too far before putting 5 or 10 pounds of air in the bag.

Watch the steam pressure. Keeping an even temperature while the cure is being made cannot be rated as unimportant in securing the proper cure.

No mold should be used which does not have pet cocks at the dead end to remove the cold air and wet steam. Dry blue steam is necessary in securing a perfect cure and an even temperature.

If a soft cure results in some parts of the tread, or repair, do not blame the stock. See if the return line of the mold is not stopped up and the mold partially filled with water.

A little overcure is better than an undercure, but it is always best to know exactly what length of cure to give all stock and remove the repair when the rubber is sufficiently cured.

Do not hasten the drying of cement under a temperature above 85 degrees, or by hanging in a heavy draft, as this merely semi-cures the outer surface of the cement, forming a glazed condition which prevents adhesion.

Keep the shop entirely clean at all times—customers will like it better and the material and cement will run less chance of becoming spoiled.

Above all, do not be too stingy in the use of fabric and materials. Make every job the best possible, even if it means the taking of a smaller profit, for the sweetness of large profits cannot make up for the bitterness of lost or dissatisfied customers.

RUBBER TRADE INQUIRIES

The inquiries that follow have already been answered; nevertheless they are of interest not only in showing the needs of the trade, but because of the possibility that additional information may be furnished by those who read them. The Editor is therefore glad to have those interested communicate with him.

(932) A reader requests the addresses of manufacturers of knit jacket fire hose.

(933) Inquiry is made for the addresses of manufacturers of tire repair buffing stands and rotary rasps.

(934) A manufacturer desires the addresses of manufacturers specializing in blowout patches, particularly inside ones.

(935) The addresses of pump manufacturers are requested.

(936) Manufacturers of rubber hoof pads please send addresses for inquirer.

(937) Catalogs are desired by a battery concern, particularly concerning battery boxes, rubber jars, etc.

(938) A manufacturer asks for names of manufacturers of devices for trimming tire fabric in passing through the calender.

(939) A reader desires the address of the manufacturer of sponge rubber suits for aviators.

(940) A manufacturer inquires for the addresses of manufacturers of bathing-cap machinery.

(941) Request is made for the addresses of concerns in position to manufacture sponge rubber flush-balls for toilet tanks, or to market them on royalty basis.

(942) A manufacturer desires the address of a concern making sponge rubber.

(943) Inquiry is made for morila gum, said to be manufactured in powder, gum and paste form.

(944) A correspondent desires to know where he can obtain rubber vacuum cups 1½ inches in diameter.

(945) Inquiry is made for addresses of manufacturers of men's rubber belts.

(946) A reader wishes the address of the supplier of a machine for stripping dipped goods from forms.

(947) A request has been received for addresses of manufacturers of very small fabric or silk tubing impregnated with rubber similar to raincoat or balloon fabric.

Trade Opportunities from Consular Reports

Addresses may be obtained from the Bureau of Foreign and Domestic Commerce, Washington, D. C., or from the following district or cooperative offices. Requests for each address should be on a separate sheet and state number.

DISTRICT OFFICES.

New York: 734 Customhouse.
Boston: 1801 Customhouse.
Chicago: 504 Federal Building.
St. Louis: 402 Third National Bank Building.
New Orleans: 1020 Hibernia Bank Building.
San Francisco: 307 Customhouse.
Seattle: 848 Henry Building.

COOPERATIVE OFFICES.

Cleveland: Chamber of Commerce.
Cincinnati: Chamber of Commerce; General Freight Agent, Southern Railway, 96 Ingalls Building.
Dayton, Ohio: Dayton Chamber of Commerce.
Los Angeles: Chamber of Commerce.
Philadelphia: Chamber of Commerce.
Portland, Oregon: Chamber of Commerce.

(182) A manufacturing firm in Switzerland desires to purchase machinery for pressing designs or zigzag shading on the outside of hard rubber fountain pens and pencils.

(192) A mercantile firm in Cyprus desires to secure an agency for the sale of motor tires.

(224) A commercial agent in Bulgaria desires to secure an agency for the sale of rubber goods of all kinds. Quote c. i. f. Bulgarian ports or Constantinople.

(240) A manufacturer of corsets in Chile desires to purchase elastic webbing, etc. Quote c. i. f. Talcahuano. Correspondence in Spanish.

(244) A merchant in Spain desires to purchase and secure an agency for the sale of copper wire, both insulated and plain, for commercial electric wiring, and all necessary accessories. Quote c. i. f. Spanish port or f. o. b. American port. Payment against documents at destination.

(252) A firm of importers in India desires to purchase and secure an agency from manufacturers for the sale of fountain and stylo pens, toys, dolls, electric novelties, etc. Quote c. i. f. port of India. Payment through bank against documents.

(315). A commercial agent in the Netherlands desires to secure an exclusive agency for and purchase rubber goods. Quote c. i. f. Rotterdam or Amsterdam.

(324). A merchant in Norway desires to secure the representation of firms for the sale of electrically driven portable tools, diving outfits, etc. Quote f. o. b., New York; 30 days cash against documents through Norwegian bankers.

(340). An importer and commercial agent in Italy desires to purchase or secure an agency for the sale of transmission belts. Correspond in Italian.

Graphic Charts for Office and Factory

A Practical Description of Rectilinear and Ratio Charts

By Allan C. Haskell[1]

A FEW years ago the use of charts was confined chiefly to engineers; today graphic methods are employed increasingly by executives, managers, statisticians and accountants in many lines of business. Those who do use them systematically have come to appreciate their value where a clear, concise exposition of conditions—financial and operating—is desired. So far as it is possible to discover, the principal reason why very many more people do not take advantage of this remarkable instrument for demonstration and control is because they have a mistaken idea that it savors of mathematics and is, accordingly, difficult to understand.

A graphic chart is essentially a pictorial representation of quantitative facts or figures, and requires very little mental effort to comprehend it. Graphic charts permit the complete and quick comprehension of business events and eliminate the necessity of studying long columns of figures or voluminous reports. There is nothing complex or difficult to understand about them. A knowledge of higher mathematics is wholly unnecessary. All that is required is ability to read a scale, a comprehension of what the functions of various rulings are and when it is best to use one and when another.

How Graphic Charts Are Made

Any one who can read a thermometer can read a graphic chart. Supposing it was necessary to keep a record of the temperature in one's dining room at 8 a. m., every morning for a week. We will say the following degrees of temperature were recorded on succeeding days: Monday, 62; Tuesday, 68; Wednesday, 57; Thursday, 60; Friday, 72; Saturday, 59; Sunday, 63.

Now make a graphic chart of these facts as shown in Fig. 1. Vertically along the left edge of the chart paper make a scale to correspond to the thermometer, each small square or division on the paper representing two degrees on the thermometer. Horizontally along the bottom edge write at equal intervals, Mon., Tues., Wed., etc., to represent the days of the week. Then directly above Monday make a dot opposite 62 in the temperature scale; above Tuesday make a dot opposite 68 on the temperature scale, and so on, through the week. Then, in order to obtain a better idea of just how the variations look, connect these points with lines and get what is commonly called a "curve." Immediately the high spots, or "peaks," and the low spots, or "valleys," stand out prominently and the result is a comprehensive picture of just how the temperature went up and down during the week.

Furthermore, an apartment should be at least 68 degrees, so make points above Mon., Tues., Wed., etc., at 68 and connect them. This gives a straight line—the line of "standard temperature," as it might be called. At once it is apparent that only on two days was the temperature up to standard and on the other five it was considerably below, particularly on Wednesday.

Of course, in the simple example shown, the facts deduced from the chart are also obvious from the figures in the table, but even here the facts stand out more clearly and forcibly in the chart. Much more strongly is this result emphasized when one is dealing with facts or figures extending over a period of not a week but of a month, a year, ten years, comparing many things, one with another. But no matter how long the period of time covered or the number of curves charted, the method of constructing the chart is no different from that just described, modifications being made to fit the conditions.

The Rectilinear or Arithmetic Chart

In most common use is the chart ruling like Figs. 1 and 2, the so-called rectilinear or arithmetic chart. It is used most frequently because many people have not had their attention called to any other kind and because many who have recognized the value of other kinds have been unable, until comparatively recently, to buy them properly ruled.

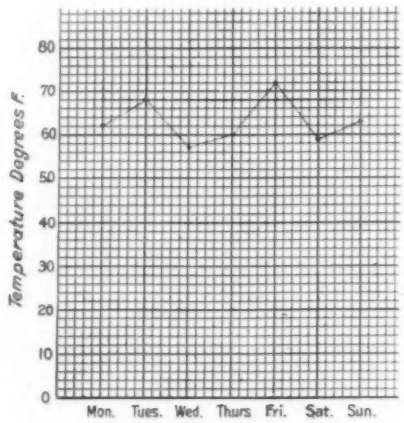


Fig. 1. Rectilinear Chart of Room Temperature by Days

However, although the rectilinear chart is valuable, when used correctly, sometimes it gives wrong and misleading impressions when employed to do certain things for which it is not adapted. The rectilinear chart is perfectly proper in its place, but should not be used indiscriminately.

The chart rulings in Fig. 1 and 2 are called rectilinear because they are made up of right or straight lines. All of the vertical lines are usually the same distances apart and all of the horizontal lines are the same distances apart, but the spacing vertically may or may not be the same as that horizontally. Business statistics are usually charted with reference to periods of time, as days, weeks, months, years, etc., and usually the data charted involve dollars or decimals. Therefore, there have been designed rectilinear charts for business statistics which have decimal ruling vertically, such as twenty divisions per inch, to take care of dollars, etc., and have time ruling horizontally, as twelve divisions per inch for months in the year, and others which may be made to conform with any periods of time from hours to years.

The rectilinear chart should be used where it is desired to obtain a picture of *numerical* differences only, for example, to show the number of tires produced from month to month, or income, in dollars, from week to week, or some similar data.

The Ratio or Semi-Logarithmic Chart

Almost always, however, it is not merely numerical differences we want to know, it is *percentage* differences. We do not care so much to know the difference in dollars in our income and expenses from month to month as we do to know whether the

[1] Author of "How to Make and Use Graphic Charts." The Codex Book Co., 119 Broad street, New York, N. Y.

percentages of increase or decrease in the one are greater or less than the percentages of increase or decrease in the other. It is the relative effects with which we are concerned, much more than with the differences in magnitude. To show relative effects or percentage variations the semi-logarithmic or ratio chart must be used. The rectilinear chart gives not merely an inadequate picture; it gives an incorrect and misleading picture.

The ratio chart has one or more cycles of logarithmic or ratio ruling vertically and rectilinear ruling horizontally. It is just as easy to use as the ordinary rectilinear chart and one needs only to appreciate what it will do and to cultivate its use until thoroughly familiar with it. Fig. 3 has two cycles or decks of ratio ruling vertically, the first being numbered 10,000 to 100,000 and the second from 100,000 to 1,000,000.

Until within recent years it was not possible to buy chart papers with ratio ruling, but now they are available in a considerable variety; in 8½ by 11-inch size with 1, 2 or 3 cycles and where a large scale range is desired there is an 11 by 17-inch sheet with 5 cycles of ratio ruling.

The number of cycles required is determined by the range of the data to be charted. If it is desired to start with 1, one cycle gives a range of 1 to 10; two cycles, 1 to 100; three cycles, 1 to 1000; 5 cycles, 1 to 100,000; and so on. But it is not necessary to start with 1. The properties of the ratio rulings are such that a true picture of percentage variations is obtained, no matter what

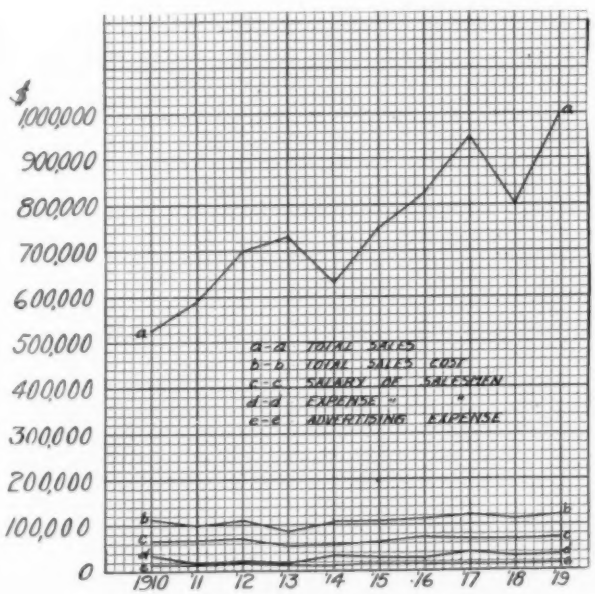


Fig. 2. Rectilinear Chart—Compare with Fig. 3

the scale used may be, or upon what portion of the sheet the curves come. It is just as permissible to start with 10, or 100, or 1000, or 10,000, etc., or with 0.1, or 0.01, or 0.001, etc., depending upon the data to be charted.

On the rectilinear chart the base line, or zero line, should always appear, for it is with reference to this line that numerical differences are measured.

Rectilinear and Ratio Charts Compared

The fundamental difference between the two kinds of charts is as follows: On the rectilinear chart the same *numerical* difference is always represented by the same vertical distance, whereas on the ratio chart the same *percentage* difference is always represented by the same vertical distance. For example: In Fig. 2 the vertical distance between 100,000 and 200,000 is the same as between 500,000 and 600,000, because the numerical difference is the same—100,000—in both cases. Note this fact, however: that while the numerical increase is the same in both cases, the percentage increase is quite different, being 100 per cent in the first case and 20 per cent in the second.

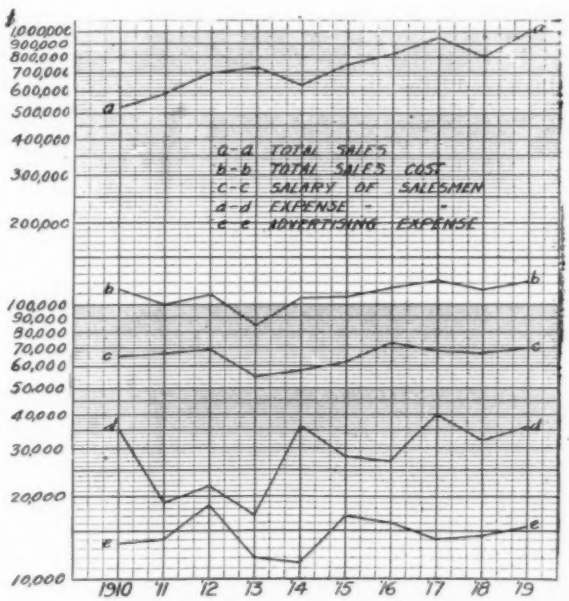


Fig. 3. Ratio Chart—Compare with Fig. 2

Now examine Fig. 3. The vertical distance from 100,000 to 200,000 (100 per cent increase) is considerably greater than from 500,000 to 600,000 (20 per cent increase), but is the same as from 500,000 to 1,000,000 (100 per cent increase). Also, the distance from 100,000 to 120,000 (20 per cent increase) is the same as from 500,000 to 600,000 (20 per cent increase).

TABLE 1

Year	Advertising Expense	Expense of Salesmen	Salary of Salesmen	Total Sales Cost	Total Sales
1910	$13,500	$35,000	$65,000	$113,500	$525,000
1911	14,000	19,000	67,000	100,000	590,000
1912	18,500	22,000	69,000	109,500	700,000
1913	12,000	17,000	55,000	84,000	730,000
1914	11,500	36,000	58,000	105,500	630,000
1915	17,000	28,000	62,000	107,000	750,000
1916	16,000	27,000	73,000	116,000	825,300
1917	14,000	40,000	68,000	122,000	950,000
1918	14,500	32,000	67,000	113,500	800,000
1919	15,500	36,000	70,000	121,500	1,000,000

The data in Table 1 have been charted on Fig. 2, rectilinear chart, and on Fig. 3, ratio chart. Note the following facts: In Fig. 2 it appears as though there were extreme fluctuations in total sales and very little variation in the other items. In Fig. 3 the fluctuation of total sales is much less marked and that of the other items much more so. This is a correct picture of percentage variations and it will be noted that actually there has been much more variation in expenses of salesmen, advertising expense, etc., than in total sales.

For example, the total sales were $825,000 in 1916 and $950,000 in 1917, an increase of 15.1 per cent. For the same years the expenses of the salesmen were $27,000 and $40,000, an increase of 48.1 per cent. Yet in Fig. 2 the increase of total sales is represented by a vertical rise of 12.5 spaces and that of expenses of salesmen by 1.3 spaces. Thus, while the percentage of increase of total sales was much less than that of expenses of salesmen, it shows in Fig. 2 as though it were nearly 10 times as great.

It will be noted also that while curves b, c, d and e are pretty

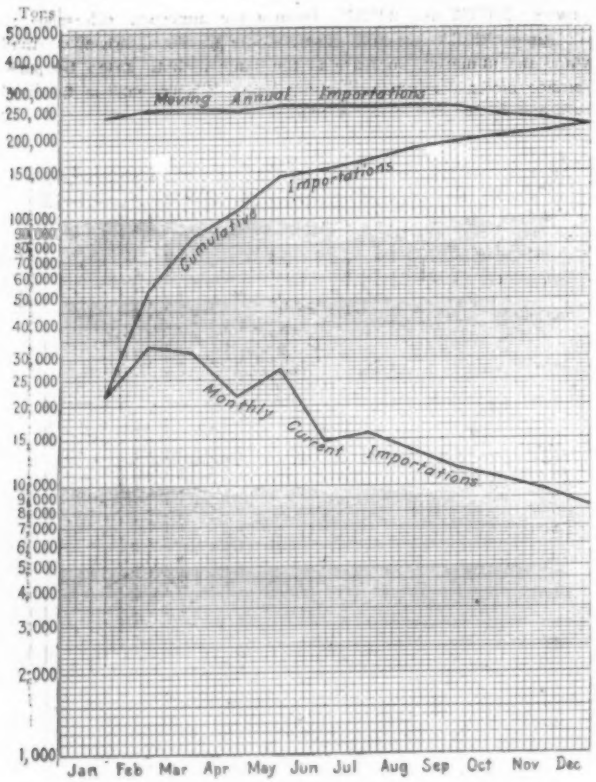


Fig. 4. Ratio Chart Comparing Annual, Monthly and Cumulative Crude Rubber Imports

well jumbled together in Fig. 2, they are spread out in Fig. 3, and whereas in Fig. 2 it is difficult to read the values of the

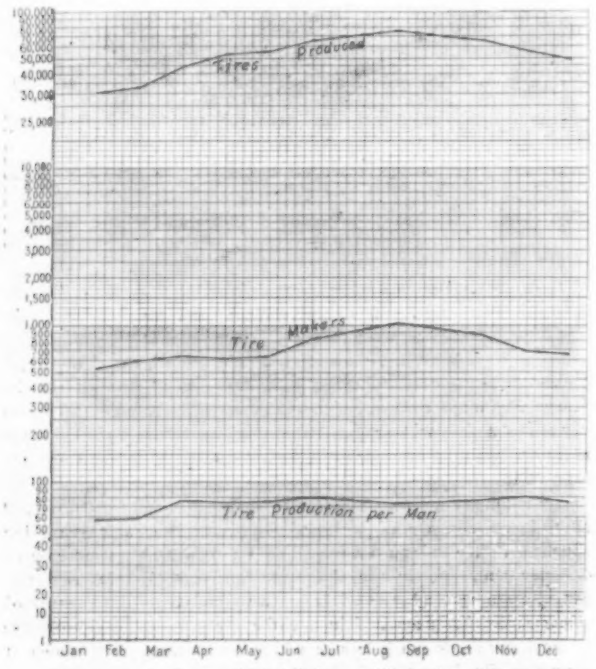


Fig. 5. Ratio Chart—Monthly Comparison—Tires Produced, Number of Tire Makers, and Production per Man

various points with any degree of accuracy, it is easy in Fig. 3. Even in the upper ranges, as in curve a-a, the values may be read nearly as accurately in Fig. 3 as in Fig. 2.

Rubber Statistics Plotted on Ratio Charts

A ratio chart of 1920 statistics of crude rubber in long tons is given in Fig. 4, showing for the United States the total annual importations ending each month of the year, called the "Moving Annual Importations," the monthly current importations and the cumulative importations. These curves are strictly comparable with each other because drawn on the same scale and on the ratio ruling which preserves their true percentage relations as well.

Fig. 5 is a ratio chart comparing by monthly intervals tires produced, the number of tire makers who made them, and the tires made per man. In this case a four-deck ratio sheet was required scaling from one to 100,000 in order to include the tires per man and the tires produced. It should be noted that with the rapid increase in number of workers between May and August a falling off in production per man showed, because the new help were mostly learners. Another instructive curve that might be shown on this sheet would be the production of seconds as influenced by the addition of tire makers to the working force.

The ratio chart may be usefully employed in visualizing the statistics of production, pay-roll, costs, material prices, production, sales, etc., where it is desirable to study the mutual influence of related items over any period.

EFFECT OF TEMPERATURE UPON RUBBER INSULATION OF WIRES AND CABLES

For many years the National Electrical Code has specified that wires having a rubber insulating covering shall not be used in places or locations where the temperature exceeds 120 degrees F. (49 degrees C.). The Electrical Department of the Chicago Underwriters' Laboratories recently concluded a series of baking tests at three different temperatures upon six representative samples of labeled rubber-covered wire. These tests were carried on simultaneously at 125, 150 and 175 degrees F., using separate ovens, electrically heated and with calibrated thermostatic controls. Physical tests of the insulating coverings were made for tensile strength, stretch, and recovery.

The deductions to be made from these tests are general rather than specific, and are based solely on changes observed in the test performance of these particular compounds in regard to one property only, tensile strength. With severe exposure to heat, all the compounds approach a common minimum value.

The average results indicate that at 125 degrees the standard value of 500 pounds per square inch for tensile strength is passed after 36 days' exposure. At 150 degrees this time was reduced to six days, while at 175 degrees the limiting value of 500 pounds was reached in about three days. At 125 degrees the change in the compounds appears to be fairly uniform as to time, without the pronounced early decrease in strength as noted for the higher temperatures.

Everything considered, these results seem to establish the reasonableness of the existing limit of the National Electrical Code Rules and indicate that raising this temperature limit for the common use of rubber insulated wires would be unwise and perhaps result in an accelerated deterioration of insulations subjected to such high temperatures.

FOR THE FIRST HALF OF 1921, THE UNITED STATES RETAINED 69,678 tons of rubber against 164,236 for corresponding months, 1920. It must not be taken for granted that the United States consumption was only about 70,000 tons for the six months ended June 30. The available supplies in the United States, at the beginning of the year, were certainly more than they are at the present time.—Rickinson.

The Great Rubber Suggestion Contest

Prize Winners and Awards

THE Rubber Growers' Association, Incorporated, of Great Britain, has announced the awards in the competition for ideas and suggestions for extending the present uses and for encouraging new uses of rubber, which began in July, 1920, and closed December 31, 1920. Nearly 10,000 suggestions were received from some 2,000 persons in various parts of the world. The judges were:

Alexander Johnston, managing director of the North British Rubber Co., Limited, Castle Mills, Edinburgh, and chairman of the Research Association of British Rubber and Tyre Manufacturers.

H. J. Glascodine, head of the Technical and Patents Department of George Spencer, Moulton & Co., Limited, and Wood-Milne, Limited.

Thomas H. How, chairman of the Engineering Section of the London Chamber of Commerce.

H. L. Symonds, S. Morden & Co., Limited, manufacturers, deputy chairman of the Court of the London Chamber of Commerce and ex-chairman of the Manufacturers' Section.

Lancelot C. Bullock, Markby Stewart & Co., solicitors.

Disappointment was expressed by the judges at the lack of suggestions of novel and outstanding value. Even where a new use for rubber was proposed it failed to accord with one or more of these determining factors: maximum consumption of rubber, practicability in relation to manufacturing resources, practicability from point of view of cost, and ease of exploitation.

A thousand competitors urged rubber flooring, paving, or roadways, but the judges say that not one gave a really useful method, especially for laying road covering, ignorance of the physical properties of rubber and of manufacturing methods being very manifest.

Nevertheless the adjudicators noted many ideas that may be worked out into practical features of value, and it is proposed that a handbook be prepared giving to the trade in condensed form all the suggestions of evident or potential merit. Meanwhile the Rubber Growers' Association will list and issue at once to all manufacturers the suggestions received, supplementing this later with other detailed pamphlets as the work of classification and elimination progresses.

In considering the awards we cannot refrain from adding comments as they pass in review. Not in a point of criticism but rather to picture the "state of the art" as it relates to each item.

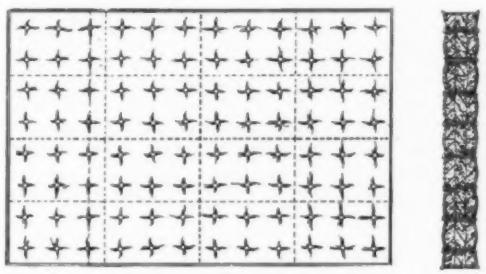
The Sponge Rubber Suggestion

A prize of £1,000 for the suggestion of using sponge rubber for general upholstery purposes including the making of mattresses, divisible among 114 competitors.

The fact that sponge rubber mattresses and cushions are not new was doubtless known to the rubber members of the committee of awards. Their decision rested upon the apparent field for such use. It is interesting, however, to cite here U. S. patent No. 756,147, February 16, 1904, issued to M. L. Derrick, a veteran American rubber superintendent. The invention is of a mattress made of a number of layers of sponge rubber, each layer made up of a number of slabs with abutting joints, the slabs of one layer arranged so as to break joints with the next succeeding layer. The whole is covered with ticking and the sponge rubber held in place by stays. The illustration shows the plan and a transverse section of the mattress.

At present the high-class cushioning, and mattress filling material is curled hair. A fine grade is worth $1 a pound. A pound of it would be in volume equal to about five pounds of sponge rubber of medium sponginess. A curled hair mattress weighs about 30 pounds. One of sponge rubber would therefore weigh at least 100 pounds, and would be made in sections, for ease in handling. When it comes to dispossessing other mattress stuffings, as kapok, cotton bats, etc., of course it is far superior in sponginess, and the difference in weight by volume is not as great. The cost, however, is a feature that would perhaps mitigate against it. At all events, with 30 pounds of cushion material a person for the United States and Great Britain, not to mention the rest of the world, there is in sight a vast market, if it can be developed.

If the sponge rubber mattress comes into its own, some form of deodorization will be necessary to kill the rubber smell. So



Sponge Rubber Mattress

far the use of animal charcoal is the standard. Possibly, however, some line of compounding may develop that will make the product odorless.

To be sure, sponge rubber partially vulcanized may be much more thoroughly sponged by the French process that produces caoutchouc mousse or rubber foam. This is very light and porous, but how long it would last in a mattress is not known. The process, by the way, entails the inclosing of partially vulcanized rubber, massed, in a steel tube, with nitrogen at a pressure of 3,000 to 4,000 atmospheres. When the tube is opened, the gas-filled rubber expands to four or five times its original volume.

Rubber Paints

A prize of £500 for the suggestion of incorporating rubber in liquid form with paint or other composition for use in the preservation of wood and metals against the action of the sea and in prevention of the fouling of ships' keels, divisible among 5 competitors.

A prize of £500 for the suggestion of the use of rubber in paint for general decorative and preservative purposes, divisible among 9 competitors.

Back in the eighties, when the Editor of THE INDIA RUBBER WORLD was superintendent of a rubber factory in Connecticut, mixings were called paints, not compounds. It came from the original Goodyear nomenclature, and after all it is fairly accurate. Certainly rubber in solution, put on cloth by a spreader, is painted on. However, the prize was not for spreader compounds, but for application to surfaces, such as walls, ceilings, etc.

The manufacture of rubber paints and varnishes is of very ancient date. By this is not meant the so-called rubber paints that have an asphaltum base, but rather those that actually contain rubber. As a rule, these are made of rubber in a convenient solvent, a certain amount of boiled oil, with coloring matter added, together with a dryer or an ingredient that effects some vulcanization. The dryer, as a rule, is litharge. The coloring

matters so far used are vermilion, antimony, oxide of zinc, sulphate of zinc, Venetian red. Indeed, about any pigment may be used. In some cases the base is rubber in solution, as naphtha; in others, rubber boiled with various oils, and still others, have melted rubber.

The Macintosh rubber paint, which was of the non-cracking variety, called for melted rubber combined with saponified oil, using lime for a thickener and adding pigments for color.

The protection of ships' bottoms by paints has almost from the beginning interested rubber men. Most of the early formulas called for gutta percha as a base. To discourage the growth of marine plants it was compounded with animal and vegetable oils and pitches. To kill barnacles and borers poisonous matters were added, as sugar of lead, arsenic, and phosphorus.

Rubber paints and varnishes held to much the same line of compounding. One of the very first formulas was a combination of rubber latex and coal tar, patented by Thomas Hancock. Robinson, who later evolved a compound of rubber, asphaltum and sulphuret of arsenic, while Ford (not Henry) combined rubber and salts of copper, using naphtha as a solvent. De Brion combined rubber, pitch, and shellac rosin with bisulphide of carbon for a solvent. For poisons he used hydrocyanic acid, chlorocyanide of mercury or arsenate of copper. Many other types of paint with more or less rubber were suggested as anti-fouling compositions, but the above show the lines along which work has been and doubtless will be done.

Finally, the tire paints of today are many of them actual rubber paints, and point to progress along this line of the prize suggestion.

Mud Guards for Motors

A prize of £500 for the suggestion of the use of rubber for the valances and mudguards of motor vehicles, divisible among 8 competitors.

As to rubber mud guards for automobiles, very little has been attempted. It is, however, possible that a semi-hard compound could be evolved that would take paint and finish as well as the rest of the car. Regarding curtains for such purpose, a firm in Chemnitz patented a valance that called for 75 per cent rubber, 5 per cent wool dust, 5 per cent pulverized fruit stones, 10 per cent bleached amber varnish and 5 per cent leather waste. This was run in thin leaves and plied together. What it would do in use does not appear.

Rubber and Portland Cement

The incorporation of rubber with cement for building purposes, divisible among 2 competitors. £100.

The use of waterproof gums, rubber and others, in the outside treatment of cement has already been proved. A very recent example is the Ocotillo gum used in protecting certain South American cement structures.

As for rubber, Freeman made bricks of rubber, sand and broken stone to take the place of cement bricks. Barrett exhausted the air from cement bricks, and impregnated them with rubber. Dodge combined rubber, oil and Portland cement, making tubes for carrying liquids, while Norton combined rubber, pitch, oils, gluten and Portland cement for a great variety of purposes.

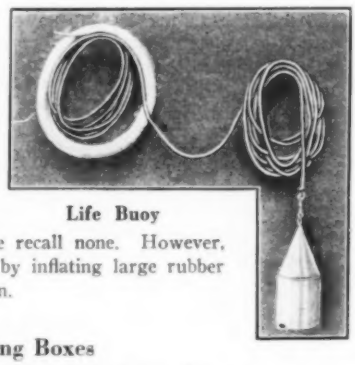
Cistern Covers

For the use of rubber as a heat-retaining covering for hot water cisterns, £100.

Insulation is insulation. If, therefore, the modern, rubberized felt engine and radiator cover works on automobiles, why not on hot water cisterns.

Sea Buoys

For the use of rubber for the construction of sea buoys, divisible among 4 competitors, £100.



Life Buoy

Should this by any chance mean life preservers, a thousand and one examples could be cited. If ships' buoys, we recall none. However, sunken vessels are raised by inflating large rubber balls of special construction.

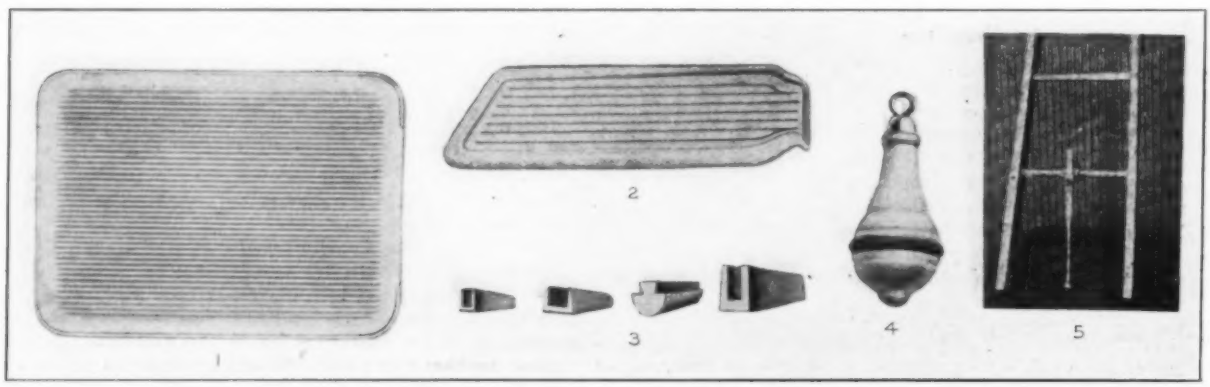
In Packing Boxes

For the use of rubber for the lining for egg-boxes, divisible among 3 competitors, £100.

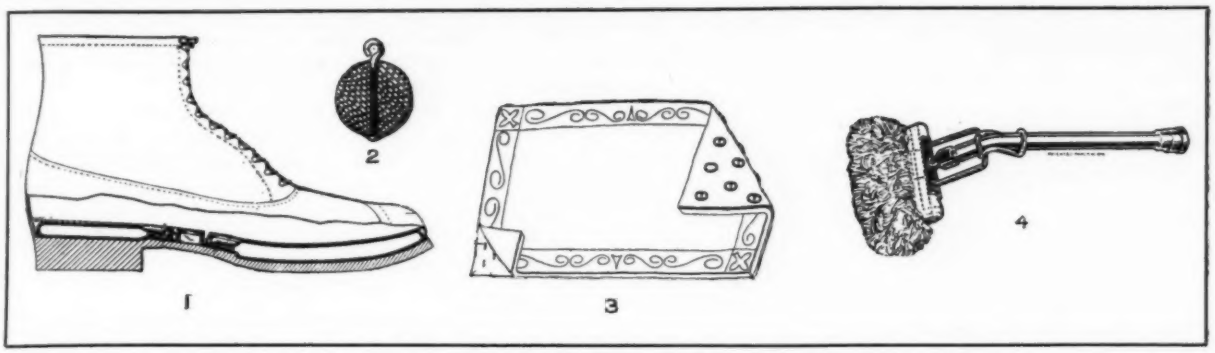
For the suggestion of using rubber for the lining and divisions of bottle packing cases, divisible among 2 competitors, £10.

The use of rubber in packing boxes and cases, while not at present large, has had considerable attention. Corrugated sheet was a very favorite suggestion. Possibly the neatest arrangement was the double case with a rubber lining between. The sheet of rubber was surfaced with rubber knobs one-quarter of an inch high, which made a perfect non-shock cushion. These cases were used for shipping glass photographic plates.

For the use of rubber in the construction of ship and wharf fenders, divisible among 32 competitors, £100.



(1) Sink Mat (2) Drain Board Mat (3) Window Channels (4) Chain Pull (5) Ladder Caps



(1) Pneumatic Inner Sole (2) Pendent Handle (3) Rubber Underfelt (4) Water Deflector

Washstand Tops

For the use of rubber for washstand tops, divisible among 18 competitors, £100.

So many different inventions center about the washstand and sink that it is difficult to pick the most significant. Those on the market are sink mats, drain-board mats, both plain and perforated, some having raised sides and molded corrugations to allow drainage. They are particularly valuable in saving dishes from breaking in enamel and iron sinks. Perhaps more in the line of the prize suggestion, however, is the Rosenfeld wash bowl and water receptacle, which is really an inner bowl of rubber, lining the wash bowl and extending over the washstand.

Soft Rubber Buttons

For the manufacture of soft rubber buttons, divisible among 31 competitors, £100.

A compound for buttons which are neither hard nor soft is what is known as the Jenks. This consists of boiled leather scraps, to which is added a little glue and some oxalic acid. That is known as solution No. 1. No. 2 consists of resin, pitch and wax. No. 3, rubber boiled in linseed oil. The three solutions are combined and enough plaster and pigments added to give color and semi-solidity.

The actual soft rubber button appears to take its beginning from the well-known British rubber manufacturer, James Lyne Hancock. In 1890 this gentleman brought out a molded soft rubber collar stud. How it took on the market is not important. It was doubtless of value, else he would not have launched it. As to later uses of soft rubber buttons, those used in certain hose supporters are perhaps the best known.

Rubber "Underfelts"

For the use of rubber under carpets in place of underfelts or felt paper, divisible among 35 competitors, £100.

For a long time, to prevent slipping on polished floors, sheets of corrugated rubber matting, with the fabric side toward the rug, have been sewed upon the under side of the rug to keep it from slipping. That is common in the mat business and is not subject to patent. There are, however, numbers of patents for rubber suction cups underneath rugs and carpets, corner-pieces, edge-pieces and center-pieces, consisting of suckers, or corrugated rubber, and one patent in particular that calls for the use of a complete sheet of such suction cups extending under the whole surface of the rug.

Window Channels

For the use of rubber channeling in place of putty for fixing glass in windows, divisible among 3 competitors, £100.

Putty of rubber is in very general use today in the repair of tires. Inleed the Dunlop Stopit Putty is well known all over the British Isles. The doughs supplied by all big tire makers are rubber putties. That they would hold window glass in place even better than the present whiting compound, goes without saying. Actually, however, the suggestion was for rubber channels instead of putty of any sort. From a recent catalog we therefore show several types.

Chain Pulls

For the use of rubber for molded blind acorns and cistern chain handles, divisible among 8 competitors, £100.

In American nomenclature, these are known either as "pulls" or pendant handles. The most common is a wooden pull with a rubber ring around its larger circumference. This, of course, uses only a little rubber. The Smith pull or pendant handle is, however, a spherical rubber body with a spindle molded through it, in the upper end of which is an eye which attaches to a chain. It is needless to say that there are many variations of even this simple invention.

Rubber Clothes Pegs

For the suggestion of making rubber clothes pegs, divisible among 7 competitors, £35.

Rubber-covered wardrobe hooks are not uncommon. Often finger cots are slipped over a certain heavy type. Short lengths of rubber tubing are also used to cover the wire.

Fillet for Patterns

For the suggestion of using rubber as fillet for pattern makers, divisible among 4 competitors, £20.

Friction tape is often used for inch binding. Here, too, is an opportunity for using the tire dough previously mentioned.

Ladder Foot Caps

For the suggestion of using rubber caps for the ends of ladders for the prevention of slipping, divisible among 6 competitors, £20.

Beginning with the humble washerwoman, whose two-legged washboard is really a ladder in brief, the lower ends are rubber-capped. Continuing on to real ladders which have the dangerous faculty of slipping, quite a variety of safety devices in the way of rubber anti-slipping caps have been evolved. We add one illustration which is practically self-explanatory.

Pneumatic Soles

For the suggestion of using rubber for pneumatic bouncers attached to footwear for aiding pedestrians and for purposes of sport, divisible among 2 competitors, £15.

Rubber soles that have an extra bounciness or spring have been a favorite product of the inventive mind. They are too numerous to quote, but classify themselves as sponge rubber soles; cushion soles having air cavities, and pneumatic soles that contain air under pressure. How much they add to one's jumping power has not so far been ascertained. Typical inventions of this sort are the Weigand and Rieder sole of sponge rubber, the Foster air cushion sole, and the Moore pneumatic sole.

Rubber for the Arctic Regions

For the suggestion of using rubber for Arctic and Antartic equipment requisites and purposes, £10.

The use of rubber in the Arctic is indicated in the footwear of the lumber jacks of the North. Felt boots, rubber overs, fur-lined rubber boots, and arctics, such as those so long made by "Prowodnik" in Russia have been very close to the North Pole. Fur coats with a lining of cloth and an inner layer of rubber keep out the cold as nothing else can. One might add the tents and boats that were used as far back as the Franklin expedition, in all of which either rubber or gutta percha were prime requisites.

Vat Linings

For the suggestion of rubber linings for preservation of bleaching vat, £25.

Bellows

For the suggestion of using rubber in the manufacture of bellows; particularly for foundry purposes, divisible among 2 competitors, £15.

Bellows of leather were very early supplanted by those of rubber. Almost every form has been suggested by Goodyear, Hancock, and later inventors. Possibly the most extended use of the bellows principle is in the vestibule of a "solid train." Here are bellows diaphragms of heavy duck rubberized, opening and closing with the sway of the train.

Bottle Caps

For the suggestion of using rubber as slip-on jar and bottle covers, divisible among 10 competitors, £50.

Bottle caps in great variety have long been brought to the attention of bottlers, and some have been put into use. A very simple one is the Culver, a metal cap, rubber-lined, that fits over the neck of a bottle and by a half turn is made secure. More elaborate is Almquist's safety cap, for ink bottles, one of the first of many inventions of this sort. It is, in brief, a rubber cap that fits over the neck of the bottle. Through it passes a tube that allows the pen to dip into the neck, but in the event of an upset, keeps the contents from spilling.

One of the very early products of the pioneers in rubber was the bottle cap. Hancock, for example, pictured one of sheet rubber to stretch over the mouth of a bottle or jar and fully protect the contents.

Surfacing Cement

For the suggestion for the use of rubber in the crêpe form for rough surfacing cement, £15.

For the suggestion of rubber covers for door handles, divisible among 3 competitors, £15.

For the suggestion of using rubber for gramophone table tops, £10.

For the suggestion of using rubber kneecaps for colliers, £10.

Rubber Lubricants

For the suggestion of using rubber in the composition of certain lubricants.

Adding rubber to lubricating oils to give body is excellent, if it be done advisedly. As a preliminary, select a rubber that is as free from resin as possible; then follow Coleman, who digested rubber in refined shale oil, and later advised any mineral oil; or Johnston who did the same with vegetable oils, particularly olive oil. For a running rule, little rubber for light oils, more rubber for heavy machinery oils, was advised.

Water Deflectors

For the suggestion of rubber water deflectors for the handles of mops and brooms, £10.

The usual appliance, which is not the subject of a patent and which is often applied at home, is a circular disk of rubber with a hole in the middle, which is forced over the handle of the mop, down near the head. Perhaps the most ornate variation of this is the water deflector on automobile mops.

In conclusion, while the list is a bit discouraging, it should be recalled that a great impetus will be given to development in all of the above lines which in itself is worth the effort.

NEW USES FOR UNVULCANIZED RUBBER

Since the Rubber Exhibition held in London last June, much attention has been given to the development of rubber manufacture along unusual lines, and many new uses for rubber have been suggested.

Rubber Mats

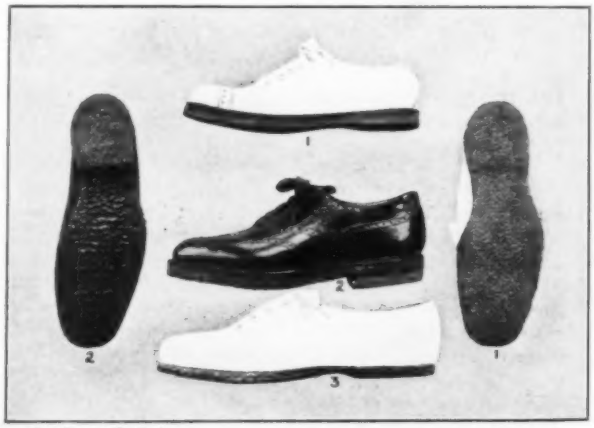
In considering these new uses it has been taken for granted that the rubber must go through the usual process of vulcanization. Recent experiments, however, have proved that this is not necessary. Rubber mats, for example, made of raw rubber crêpe, are now being manufactured in Colombo, while similar mats, made in Ceylon, have, it is claimed, given excellent satisfaction, the rubber showing no signs of deterioration after long usage. At the offices of the Rubber Growers' Association in London are two of these mats made of dark scrap rubber, with a geometrical design in translucent blanket crêpe. They are in size about 4 by 2½ feet, and one inch in thickness, weighing, respectively, 12 and 17 pounds. The process of manufacture consists in cutting the sheet rubber to the required design and then passing the whole, while wet, between rollers of a washer, that kind of "super-mangle" used on rubber estates. Trimming the edges completes the process. The actual cost of these mats is very reasonable, and several London importers are making a specialty of them.

Rubber Carpets

In Ceylon scrap crêpe carpets are being manufactured for use in offices, the material being refuse rubber which, in the ordinary course of events, would have been destroyed by the producing estates. These carpets, which have a smart appearance, and are comfortable under foot, have centers of black, lower grade scrap rubber, with white borders of crêpe of better quality. The rubber is not vulcanized or treated in any way, and, it is understood, the strips of which the carpet is made are hammered together after having been heated. These carpets were manufactured at the low figure of 34 cents a square foot.

Rubber Soles

Another use for crude rubber, and which has already passed the experimental stage, is in the manufacture of soles for shoes,



R. G. A. Bulletin

1—1 Tennis Shoes, 2—2 Golf Shoe, 3, Plimsoll

particularly those used for tennis and golf. It has been found that the Ceylon crêpe sole was not only more durable than the

ordinary vulcanized one, but that it held the ground better. It is believed that the manufacture of these new articles, which is steadily increasing, will prove most successful. By cutting these soles to size on the estates waste can be avoided, while there is also a saving in freight.

Not all blanket crêpe will do for these soles. The rubber should be specially milled to a dense gristly texture, and vary in thickness from ¼-inch to nearly ½-inch. One side of the sole must be smooth, and the other slightly rough, or corrugated. The rubber is of a bright golden color and most attractive in appearance. It is said that soles can be produced for a shilling a pair.

NEW THEORIES REGARDING RUBBER TREATMENT

New ideas are being continually advanced in regard to processes for the treatment of rubber. A recent inventor claims to have discovered a method which gives a greater elasticity and better wearing qualities to crude or vulcanized rubber. The process should be particularly useful, it is said, in rubber heel manufacture.

In processing "dead" tires, such tires must first be classified, their treatment depending upon their condition. Old tires will undergo a heating process, which will give them the desired temperature. Following that the tires will be dipped in a patented solution, whose chemical ingredients will give them a certain resiliency, as well as other characteristics. The formula for this process, which is a secret, has been prepared by a Mexican inventor.

In this connection it is interesting to note the similarity between the process mentioned and one described in THE INDIA RUBBER WORLD, June 1, 1921. This latter treatment restores to the tire, it is said, its pliancy and resiliency, and delays it aging, which begins, the inventor claims, when the tire leaves the factory. As an "auxiliary," associated with rubber and acting as a part substitute, this compound is said to restore to good condition overcured or undercured tires, new stiff hard tires, or those hardened by age.

RUBBER LATEX IN PAPER MAKING

A new use for rubber, which relates to the manufacture of paper and paper-like materials, and which has unquestionably large possibilities, has been recently patented in England by Frederick Kaye, A. R. C. S.[1]

The process consists in adding to the paper pulp, beaten to the required extent, a quantity of rubber latex proportioned to the quantity of paper to be made and the nature of the fibers and other materials used in the pulp. After thorough mixing with the pulp a coagulative agent, such as acetic acid, etc., is added according to the nature and state of the latex. Following coagulation the pulp is machined in the ordinary way. The dried paper can be vulcanized by any suitable means.

Highly satisfactory papers contain from 0.5 to 5 per cent of Hevea rubber and in papers for special purposes as high as 10 per cent of rubber derived from more resinous latex than Hevea, has been incorporated.

Paper containing rubber has a high tensile strength. The folding number, determined by the Schopper folding machine, of samples of paper containing 0.5 per cent of rubber and vulcanized, reached 5,000 to 6,000. From one fiber beaten for half the usual time a paper was made containing one per cent of rubber which showed a folding number of 72,500; tensile strength equivalent to 5,600 pounds per square inch and bursting strength exceeding 40 pounds for a thickness of one-tenth of a millimeter. These were examples of rubber latex paper without any vulcanization.

The process frequently admits saving in time of beating the pulp but also fibers of low grade can be profitably used for paper making.

[1]British patent No. 167,935.

The new process makes possible new paper products as substitutes for leather, carpets, linoleum and even textile fabrics and will create a new demand for rubber latex from the rubber-producing countries.

RUBBER-COVERED BURIAL CASKETS

In view of the search for new uses for rubber with which, at present, the world is overstocked, it may be opportune to record the attempt made nearly a half-century ago to popularize its use in the manufacture of burial caskets. Possibly the idea which failed then might prove capable of successful development under present conditions of low-priced crude rubber.

The history of the early attempt to make rubber burial caskets dates from 1875, when Frank Shearer and Frank Bassette organized the New Britain Rubber Co. They erected a fair-sized, two-story wooden factory building in New Britain, Connecticut, and began the manufacture of rubber-covered steel burial caskets, exclusively. The product was thoroughly well made and doubtless warranted the claims put forth as to durability against corrosive influences, etc. All the advantages urged, however, failed to overcome the lack of interest and the company ceased the manufacture of these caskets.

Details of construction of the rubber-covered casket made are not available, after the lapse of nearly a half-century, except as given in outline by Frank Bassette, one of the originators of the enterprise. According to his recollection the caskets were built of sheet steel riveted over a light frame of steel angles. The metal box so formed was covered with cured vulcanized rubber sheets stretched over the exterior and mechanically attached.

The company next took up the production of rubber-covered metal bits for horses. The construction of these goods must have been faulty, as the rubber covering on the metal center bars did not withstand the mouthings of the animals but crumbled away. Following failure in this attempt the factory ceased to operate and shortly after was destroyed by fire.

AMPHIBIOUS CATERPILLAR BOAT

A recent invention which is attracting considerable notice both in Europe and America is an amphibious or so-called land-and-water caterpillar boat, designed by Leon Foenquinos, an engineer of the École Supérieure d'Aéronautique, at Paris, France.

The upper works of the boat resemble an omnibus while the underbody is not unlike a tank. For land locomotion a caterpillar tractor of new type is used and for water locomotion a propeller. Power is supplied through a 30 h. p. motor in the hold of the vessel. By special equipment the amphibious boat is operable as a submarine at some meters below the surface. It is claimed by the inventor that such a vessel can be adapted for either peaceful or warlike purposes.

"La France"—Land and Water Boat

The demonstrating vessel "La France" is to serve as a model for several large merchant vessels, in the building of which considerable rubber will be required in the caterpillar equipment. Rubber packings will also be used to make water-tight joints. There will also be required massive rubber blocks serving as plugs, arranged all around the vessel at the water line. The practical development of this invention will be observed with interest.

The Manufacture of Cut Sheet Rubber Goods[1]

The Manufacture of Fine Cut Sheet Originated in England Which Continues to Supply Most of This Material Throughout the World

THE manufacture of goods from cut sheets of pure rubber originated and was developed in England among the earliest of rubber manufacturing processes. The special machinery required in the preparation of cut sheet is consequently of British design and manufacture and has never been superseded.

A large variety of articles is made from cut sheet, such as tobacco pouches, nipples, tubing, elastic bands, surgical appliances, etc., where toughness and elasticity are factors in the utility of the goods. Only the best grades of Pará rubber are used because they possess in marked degree the characteristic technically known as "nerve." This term designates a combination of high tensile strength and elasticity exemplified in a new elastic band.

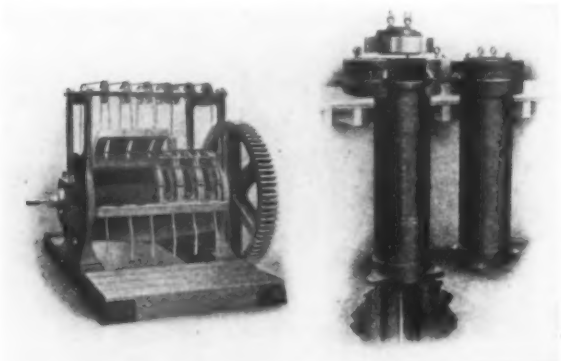
Overmilling or breaking down impairs the nerve but increases the plasticity of rubber. Rubber quality of cut sheet articles depends on retaining, as far as possible, the original nerve of the rubber. This is secured in a large degree by specially designed masticators which roll rather than tear or crush the fiber of the gum.

Preparation of the Rubber

For cut sheet goods only the highest grades of wild or plantation rubber are selected. After the usual preliminary washing to eliminate all grit or other mechanical impurities the gum is thoroughly dried and then broken down in a small masticator in preparation for further treatment in a much larger masticator capable of working up enough rubber to make the final block.

The Masticator

The masticator consists of a fluted or corrugated roll encased and rotated eccentrically in a strongly reinforced cylindrical box. The casing of the machine is opened for loading and unloading by a pair of counterweighted doors. Below is a



Rubber Masticator Blocking Press

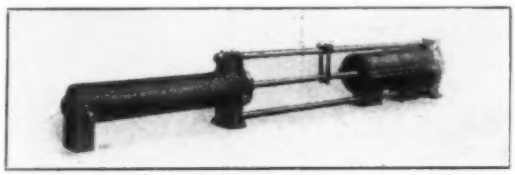
series of levers which hold the doors closed against the pressure exerted by the gum under mastication. The slots in the doors permit the escape of heat and moisture from the batch. The roll is cored through the center and piped for circulating steam or water for regulation of the working temperature.

The action of the masticator on the gum eliminates all traces of enclosed moisture and air bubbles from the mass, producing a log or cylinder of rubber, the natural fiber of which has not been impaired by any tearing action.

Block Forming and Mounting

The masticated roll of rubber is next formed into a perfect cylinder in a hydraulic blocking press. The cover of this press is secured to the top of the cylinder by a heavy bolted split-ring clamp. Pressure to consolidate the gum is exerted from below by hydraulic power.

Following formation of the rubber in the blocking press comes mounting it on a steel mandrel. This is accomplished in a horizontal hydraulic press. The cylinder of blocked rubber is placed in the steel container and a heavy steel mandrel slowly forced through it by hydraulic power, thus further compressing



Mandrel Press

the block. The mandrel also serves as an axis upon which the cylinder of rubber rotates in the cutting machine. The block varies from 3 to 5 feet in length and from 2½ to 4 feet in diameter, with conical ends.

Freezing the Rubber Block

Preparatory to cutting, it is necessary to harden the rubber to permit the production of sheets of accurate thicknesses. The hardening is effected by freezing the gum by artificial refrigeration for several days. During the freezing process the rubber is retained in a mold made in two longitudinal halves held together by bolts. On opening the mold the frozen rubber presents the appearance of a polished cylinder of *lignum vitæ*, and is then ready for the cutting machine.

Sheet Cutting

The latest type of machine for cutting sheets from the frozen gum is here shown, without the roll of rubber in place. The latter is supported by its steel mandrel mounted between centers and is made to revolve and feed against a very rapidly oscillating, highly tempered steel blade. The blade is played upon by a mixture of water and glycerine which serves as a lubricant. In this way—similar to cutting wood veneer—a continuous sheet of rubber of accurately gaged thickness is produced. Each oscillation of the knife against the elastic block is marked on the sheet by a fine ribbed effect. This appearance is characteristic of genuine cut sheet and to the trained eye and touch cannot be duplicated by any imitation process.

The thickness of cut sheet is determined by a gear-and-cam operated feeding device and varies from .01-inch to any thickness desired. The utmost cleanliness is necessarily observed throughout its manufacture, not a particle of grit or dirt being permitted in any stage of the work.

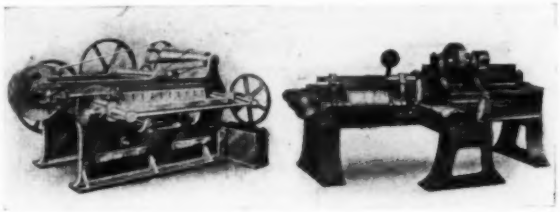
Making and Curing Cut Sheet Goods

Uncured cut sheet is handled as calendered sheet would be in making up rubber articles. To make tobacco pouches, for

[1]Illustrations from Francis Shaw & Co., Limited, Manchester, England.

example, the stock is cut out from the sheet by dies and the edges cemented and joined. The pouches are then placed over segmental perforated forms, suspended from a rack, and submerged in molten sulphur for a brief curing period. The pure uncompounded gum readily absorbs some of the liquid sulphur and temperature hastens the vulcanization.

As soon as cured the goods are boiled in a solution of caustic soda for removal of the excess of sulphur, and, finally, thoroughly rinsed in clear running water. As a finish a coating of ammoniacal



Fine Sheet Cutter **Knife Grinder**

solution of shellac is applied by means of a sponge. This adds polish to the surface and develops the deep translucent amber color desired in these goods.

The best grades of elastic bands are made from cut sheet as are also the best and most durable surgeons' and electricians' gloves, nursing nipples, hospital sheetings, tubing, catheters and many other articles for surgical and hospital use.

The military and naval establishments of various countries use cured cut sheet rubber for special purposes that are usually state secrets. Cut sheet is also used for facing special grades of card cloth made in England, to which it lends a particular cushioning and yielding effect found to be exactly adapted for delicate carding operation and without danger of sulphur being present to injure wire or fiber.

THE RUBBER INDUSTRY IN CANADA

In the manufacture of rubber goods Canada ranks fourth among the countries of the world. Of the world's rubber crop in 1920, Canada, with an importation of 10,400 tons of crude rubber, followed Great Britain and France, whose net imports were 57,000 and 14,000 tons, respectively. The United States led with 248,794 tons. The value of the Canadian rubber goods imports for the twelve months ended June 30, 1920, was $20,583,249, and for the succeeding twelve months was $11,632,300. In 1910, Canadian factories manufactured rubber products to the value of approximately $5,000,000, while in 1919 the factory value of the output was $56,000,000. Statistics regarding the manufacture of rubber tires show a correspondingly great increase. According to recent figures the sales of Canadian-made tires in 1910 were slightly over $1,000,000, while in 1919 they reached $31,000,000.

Of the 32 plants operating in the Dominion, under the management of 22 companies, and financed by Canadian, American and British capital, the Dominion Rubber System, with its various sub-divisions, leads, while Ames Holden McCready Limited, with head offices in Montreal and branches in other parts of Canada, is the second largest.

Statistics regarding importations and exportations of rubber tires, boots and shoes, and various other articles follow, with a summary of all products for the years 1919, 1920 and 1921.

In 1919 there were manufactured in Canada:

	Number	Value
Automobile tires, casings, all sizes	1,293,007	$23,298,673
Rubber tubes, all sizes	1,117,913	2,892,487
Rubber tires, solid	158,781	510,942
Motorcycle tires	8,586	74,131
Motorcycle tubes	8,717	12,396
Bicycle tires	185,613	244,521
Bicycle tubes	234,679	277,656

The following tables show Canadian imports and exports of rubber tires for the fiscal years ended March 31, 1919, 1920, and 1921.

Imports and Exports of Tires

Imports

Articles and Countries of Origin or Destination	1919	1920	1921
Tires for vehicles, solid rubber	.....	$191,424	$203,299
United Kingdom	.....	5,199	5,863
United States	.....	186,225	197,436
Other countries	.....	.....	.....
Tires for vehicles, pneumatic rubber casings	.....	1,655,118	1,903,444
United Kingdom	.....	15,351	20,449
United States	.....	1,637,507	1,797,053
France	.....	2,140	85,882
Other countries	.....	120	60
Tires for vehicles, inner tubes	.....	168,340	204,198
United Kingdom	.....	2,423	4,695
United States	.....	163,527	199,503
France	.....	2,366	.....
Other countries	.....	24	.....
Tires of rubber for vehicles of all kinds	$1,045,140	.....	.....
United Kingdom	17,121	.....	.....
United States	1,024,171	.....	.....
France	3,848	.....	.....
Other countries	.....	.....	.....

Exports

Tires	$3,016,974	.....	.....
United Kingdom	154,439	.....	.....
United States	407,162	.....	.....
Argentina	494,509	.....	.....
Australia	578,765	.....	.....
British East Indies—India	55,502	.....	.....
British South Africa	99,099	.....	.....
British West Indies—Trinidad	49,304	.....	.....
Cuba	164,819	.....	.....
Dutch East Indies	113,441	.....	.....
Japan	20,353	.....	.....
New Zealand	432,123	.....	.....
Other countries	447,458	.....	.....
Tires, pneumatic	.....	7,291,777	8,191,511
United Kingdom	.....	3,547,601	3,641,468
United States	.....	251,554	169,583
Argentina	.....	329,842	392,855
Australia	.....	829,809	793,637
Belgium	.....	86,824	3,753
Brazil	.....	66,914	167,360
British East Indies—			
India	.....	222,787	174,363
Ceylon	.....	8,406	53,913
Straits Settlements	.....	37,431	145
British Guiana	.....	15,552	22,953
British South Africa	.....	214,812	395,991
British West Africa	.....	14,649	75,310
British West Indies—			
Barbados	.....	11,408	16,561
Jamaica	.....	7,087	34,017
Trinidad	.....	26,840	20,337
Other British West Indies	.....	9,777	20,589
Chile	.....	43,219	22,441
Cuba	.....	30,385	21,067
Denmark	.....	108,244	88,026
Dutch East Indies	.....	154,916	153,717
France	.....	245,458	660,136
Japan	.....	138	20,925
Netherlands	.....	38,325	75,556
Newfoundland	.....	27,150	15,370
New Zealand	.....	589,119	553,186
Panama	.....	87,289	132,959
Peru	.....	18,384	3,974
Spain	.....	161,387	185,974
Sweden	.....	13,631	30,163
Uruguay	.....	33,404	82,471
Other countries	.....	59,435	162,711
Tires, other	.....	301,395	62,475
United Kingdom	.....	548	252
United States	.....	1,695	9,550
Argentina	.....	36,870	8,341
Australia	.....	6,217	8,421
Brazil	.....	9,447	800
British South Africa	.....	1,080	71
British West Indies—			
Barbados	.....	344	107
Jamaica	.....	.....	2,708
Trinidad	.....	1,829	555
Other British West Indies	.....	216	942
Dutch East Indies	.....	5,267	9,513
New Zealand	.....	35,467	2,904
Other countries	.....	4,415	18,311

Imports and Exports of Industrial Rubber Goods

Imports

Belting, rubber	$188,299	$161,424	$192,658
United Kingdom	8,541	2,518	10,681
United States	179,758	158,906	175,382
Other countries	.....	.....	6,595
Hose, including cotton or linen lined with rubber	135,145	112,955	142,157
United Kingdom	599	1,084	897
United States	134,546	111,871	141,248
Other countries	.....	.....	12

Articles and Countries of Origin or Destination	1919	1920	1921
Packing, rubber	119,296	94,140	85,614
United Kingdom	1,695	6,334	7,246
United States	117,597	87,806	77,772
Other countries	4	.....	596
Mats and matting, rubber	4,828	4,275	3,080
United Kingdom	.....	83	1
United States	4,828	4,192	3,079
Other countries	.....	.....	.....
Exports			
Belting, rubber	14,332	24,455	83,869
United Kingdom	.....	1,295	.....
United States	1,667	269	7,755
Australia	4,458	13,734	37,706
Newfoundland	3,156	5,767	14,806
Other countries	5,051	3,390	23,602
Hose, rubber	195,556	169,822	225,435
United Kingdom	6,550	25,137	8,192
United States	151,282	102,230	142,328
Australia	8,010	7,131	8,075
British South Africa	4,604	13,099	19,987
Newfoundland	8,107	9,744	15,687
New Zealand	6,163	5,954	15,703
Other countries	10,840	6,527	15,463

Imports and Exports of Miscellaneous Rubber Articles

Imports			
Clothing and clothing made waterproof with India rubber	$144,855	$238,180	$248,082
United Kingdom	79,232	115,634	182,407
United States	65,558	122,485	63,605
Other countries	65	61	2,070
Gloves, rubber	.....	14,034	17,248
United Kingdom	.....	216	136
United States	.....	13,813	17,112
Other countries	.....	5	.....
Elastic, round or flat, including garter elastic	252,895	403,443	485,867
United Kingdom	92,793	148,421	257,245
United States	159,348	254,741	227,436
Other countries	754	281	1,186
Hot-water bottles, rubber	.....	34,547	29,529
United Kingdom	.....	340	1,111
United States	.....	34,207	28,409
Other countries	.....	.....	9
Exports			
Clothing, including waterproofed	13,784	56,640	36,534
United Kingdom	1,720	782	411
United States	517	6,055	276
Newfoundland	4,934	34,132	30,543
St. Pierre and Miquelon	30	8,141	3,250
Other countries	6,583	7,530	2,054
All other manufactures of india rubber, n. e. s.	200,304	230,698	581,219
United Kingdom	10,688	69,665	100,399
United States	83,492	62,568	199,748
Argentina	16,289	8,417	25,537
Australia	10,284	9,277	12,450
British South Africa	9,655	7,324	30,881
Newfoundland	5,201	8,467	10,419
New Zealand	17,639	18,619	62,160
Other countries	47,056	46,361	139,625

Import and Exports of Rubber Boots and Shoes

Imports			
Boots and shoes	$194,576	$287,617	$269,055
United Kingdom	19,046	17,251	29,356
United States	175,327	270,350	239,688
Other countries	203	16	11
Exports			
Boots and shoes	2,058,715	1,750,967	1,524,969
United Kingdom	205,429	829,154	457,561
United States	135,990	3,203	2,684
Australia	258,924	286,116	470,503
British Guiana	5,992	5,385	21,770
British South Africa	103,814	18,905	9,277
British West Indies—			
Barbados	1,062	1,726	3,297
Jamaica	3,419	4,259	4,931
Trinidad	9,904	7,907	29,603
Other British West Indies	6,151	7,611	16,535

Summary of Canadian Imports and Exports of Rubber and Rubber Goods

Imports			
Total rubber and its products	$12,315,711	$18,059,435	$15,480,960
United Kingdom	630,315	4,282,954	3,568,581
United States	6,380,323	8,244,814	7,309,525
Other countries	5,305,073	5,531,667	4,602,854
Exports			
Total rubber and its products	5,629,590	10,069,963	10,839,528
United Kingdom	378,826	4,482,844	4,208,283
United States	910,035	861,121	665,240
Other countries	4,340,729	4,725,998	5,966,005

Canadian Tariff Amendment Concerning Marking of Imports

By the Customs Tariff Amendment Act of 1921 the former regulations of 1907 have been altered in regard to marking articles imported into Canada. From a memorandum of the Department of Customs and Excise, dated August 4, 1921, the following is quoted:

Section 12A. That all goods imported into Canada which are capable of being marked, stamped, branded, or labeled, without injury, shall be marked, stamped, branded, or labeled in legible English or French words, in a conspicuous place that shall not be covered or obscured by any subsequent attachments or arrangements, so as to indicate the country of origin. Said marking, stamping, branding, or labeling shall be as nearly indelible and permanent as the nature of the goods will permit.

Among the goods classed as raw materials and exempted from marking, crude rubber is noted, as well as various partly manufactured materials to be finished in Canada. In all cases a statement must be placed on record by the importer certifying to facts sufficient to classify the importations among wares exempt from marking.

DE VRIES' PLANTATION RUBBER QUESTIONNAIRE

At the September meeting of the American Chemical Society, Dr. Otto de Vries, director of the Central Rubber Station, Buitenzorg, Java, expressed the desire to correlate with the crude rubber quality needs of rubber manufacturers the rubber research work under his direction. Therefore, he has prepared the following questionnaire for the use of factory chemists who desire to make their opinion known in the Far East where it will do the most good.

Replies to the questionnaire may be mailed directly to Dr. O. de Vries, 7 Regentesseplein, The Hague, Holland, or to Arnold H. Smith, secretary, Rubber Division, American Chemical Society, Thermoid Rubber Co., Trenton, New Jersey.

Questionnaire on Rubber Qualities

Rate of Cure

1. Does the variation in rate of cure, at present existing in first-grade plantation rubber—smoked sheet and first latex crêpe—cause any actual trouble in manufacture and is it desirable that this variation be reduced? If so, what may be regarded as reasonable limits and what as undesirable deviations? State also the mixture used in testing and the average figures obtained with it in your testing method.

Is carefully prepared rubber, which is very uniform and constant in rate of cure, of value for general or for special purposes?

Test Mixtures

2. What mixtures would you suggest as the most representative ones for the testing of crude rubber, such mixtures eventually to be adopted as standard mixtures? For example: (a) rubber and sulphur only; (b) rubber, sulphur, litharge; (c) rubber, sulphur, zinc oxide; (d) rubber, sulphur, zinc oxide, accelerator or others. State ingredients and ratio of weight employed.

Tensile Strength

3. Is the tensile strength of first-grade plantation rubber always sufficient for your purposes? Chinese rubber, Singapore thick crêpe, and rubber containing dirt are excluded.

Has an especially high tensile strength, higher than the present average, any importance in general or for special purposes?

Milling Quality

4. Is first-grade plantation rubber sufficiently uniform in plasticity and milling qualities? If not, what difference do you find? What properties would be the most desirable? What method would you suggest to test this property?

Other Types of Rubber

5. What is your experience with other types of rubber, such as Brazilian hard fine, smoked balls prepared after Brazilian method on estates in the East, slab rubber (matured rubber), and others?

The Brazilian Rubber Industry

A Review of a Declining Industry

By Constant Southworth

FIFTEEN years ago the Amazon Valley supplied the greater part of the raw rubber used in the world. Today it produces less than 10 per cent. As a result of the large development of plantation rubber production in the East Indies, the price of rubber has declined to a point where the future of Brazil's rubber industry is jeopardized unless a thorough reorganization of present methods of production takes place.

Historical

Rubber has been known to the Brazilian Indians from remote periods, being used by them to make rough balls for playing games. Rubber from India—hence the term "India rubber"—was the first species of rubber known in Europe. Previous to 1820 it was used only for removing pencil marks. The Amazon Indians, however, had known for a long time that it had other uses. They first discovered its waterproof qualities. In the first half of the nineteenth century there was built up in Pará a thriving industry in the manufacture and exportation of rubber slippers made according to the system of the aborigines. To some extent, also, shoes and clothes were received from Europe to be made waterproof by covering with rubber and sent back for the use of the military forces. Pará thus, until 1850, exported rubber both in the raw and manufactured form. After the middle of the century European competition drove out the rubber manufacturing industry in Brazil. The crude rubber industry alone remained.

The promise of fortunes in the rubber export business in the nineteenth century caused great numbers of men of all races to pour into the rubber regions. In 1907 and 1908 there was an especially large inflow from neighboring states into the rubber region of the Amazon. Huge cattle-raising regions and cultivated lands were abandoned. This brought about a great dearth of foodstuffs and a rise in food price which has persisted until today. Consequently the cost of living greatly increased.

Geographical and Botanical

The most remarkable rubber-producing region of the world lies in the valley of the Amazon. It consists entirely of virgin forest, the planting of rubber trees being almost unknown and apparently unnecessary in the Amazon; for it is estimated that hardly more than five per cent of the Amazon rubber area has been exploited by the rubber gatherers.

The total area of this region is about 2,400,000 square miles, of which by far the greater part is in Brazil. However, parts of Bolivia, Peru, Ecuador and Colombia are also included. It extends from the Atlantic Ocean on the east to the southern boundary of Colombia on the west, a distance of 3,000 miles. The valley, which is about 200 miles across at the Atlantic end, broadens toward the south until it is 1,500 miles across. Practically the whole region is covered with forests.

There are four principal kinds of rubber produced in Brazil. Pará rubber is much the best and much the most important, forming 90 per cent of all the rubber on the Brazilian market. It is obtained from several varieties of the Hevea tree, chiefly *Hevea brasiliensis*, although usually a mixture of several varieties of Hevea and sometimes containing rubber from other species of rubber trees. It is produced mainly in the states of Pará and Amazonas and to a lesser degree in the government province of Acre, the states of Maranhão and the northern parts of Matto Grosso and Goyaz. Ceará or Maniçoba rubber is obtained from several species of *Manihot*, chiefly in the state of Ceára. Mangabeira or Bahia rubber, obtained from *Hancornia speciosa*, is collected chiefly in the states of Bahia, Pernambuco and Matto Grosso. Caucho rubber, from the species *Castilloa Ulei*, is produced in various parts of the country.

In the Pará rubber region of the Amazon basin there are three principal rubber-gathering districts, all lying south of the river and along its southern tributaries. These are: (1) the island section, including the numerous islands forming the Amazonian delta, and yielding what is commonly termed "island rubber"; (2) a district in the neighborhood of Manáos, including the lower reaches of the Rio Purus and the Rio Jurua, and a part of the Rio Negro, and (3) the upland districts of Bolivia, Peru and Ecuador. The first two districts named are both in Brazil. Production of Pará rubber is largest in the island district, extending from the mouth of the Amazon about 500 miles up the river, and comprising a multitude of low, tide-flooded islands and the low alluvial shores of the main stream and its affluents from the south.

Gathering and Preparing Rubber Latex

To gather the latex, a trail is laid out to cover from 130 to 150 trees, a distance of about six miles. The Hevea latex flows very slowly, and requires from 100 to 150 tappings a season. At the camps the rubber is separated from the latex by drying out the moisture over a smoky fire of palm nuts, the smoke of which contains a considerable proportion of acetic acid and creosote. A great saving of time in this coagulation has been accomplished by introducing a new treatment of the latex with a mixture of benzine and wood alcohol. The rubber latex is coagulated on wooden paddles rotated in the smoke and the *pelles* are transported to the ports of shipment, where they are graded and carefully packed in wooden boxes. The wild Pará rubber of the Amazon valley is regarded as the best crude rubber supplied to the world's markets. Its excellence is attributed by some authorities to a probable mixing of the latices from several different trees, but by the resident rubber gatherers to the soil and climate of the region, which are not duplicated in any of the sections where the same varieties of rubber-producing trees are cultivated in plantations. Whatever the actual reason for its superior quality, manufacturers hold the best wild Pará rubber of the Amazon to be equal to the best plantation grades.

Other methods are used to gather and coagulate the latex of the other varieties of trees mentioned. In most cases they are strikingly primitive and wasteful, oftentimes destroying the whole tree, and achieving a product so full of dirt as to be unusable for many purposes. The cheaper grades of Pará rubber also suffer from unsatisfactory methods of collection and preparation. As a result there is a high proportion of shrinkage on much Brazilian rubber.

Production

About 35,000 tons of rubber are produced annually in Brazil and the stretch of Amazon territory in Peru, Bolivia and Colombia, the product of which is shipped down the Amazon. The production of Brazil has not increased since 1905. On the other hand, the production of the East Indian plantations rose steadily from 146 long tons in 1905 to 304,800 long tons in 1920. In 1906 Brazilian production was 54 per cent of the world's total, the rest being mainly wild African and Asiatic rubber. Plantation rubber was less than one-fifth of 1 per cent. In 1920 Brazil produced 9 per cent and the eastern plantations 89 per cent of the world's

rubber. The following table compares Brazilian and plantation production from 1905 to 1920:

Year	Brazilian Long Tons	Plantation Long Tons
1905	35,000	146
1906	36,000	510
1907	38,000	1,000
1908	39,000	1,800
1909	42,000	3,600
1910	40,800	8,200
1911	37,730	14,419
1912	40,410	28,218
1913	39,370	47,618
1914	37,000	71,380
1915	37,220	107,867
1916	36,500	152,650
1917	39,370	204,251
1918	30,700	200,950
1919	34,285	340,225
1920	30,790	304,800

Export Situation

Table 1 shows official government figures of Brazilian exports of rubber by countries from 1914 to 1919 and the total amount for 1920.

The figures in Table 2 show the exports of crude rubber from Pará, Manáos and Itacoatiara, Brazil, and from Iquitos, Peru, to the United States and Europe by months from January, 1920, to June, 1921, and supplement Table 1. For all practical purposes they represent Brazil's exports, for the exports from Iquitos are unimportant.

TABLE 1

	1914		1915		1916		1917		1918		1919		1920	
Countries of Destination	Long Tons	U. S. Dollars	Long Tons	U. S. Dollars	Long Tons	U. S. Dollars	Long Tons	U. S. Dollars	Long Tons	U. S. (a) Dollars	Long Tons	U. S. (a) Dollars	Long Tons	U. S. (a) Dollars
United States	19,091	18,567,079	20,448	19,229,297	19,550	22,537,668	19,847	20,184,706	17,603	.....	22,930	.....	.....	.....
Great Britain	11,303	12,276,682	12,482	13,389,874	10,215	12,910,741	10,730	13,433,432	3,288	.....	6,662	.....	.....	.....
France	1,583	1,700,790	947	693,310	636	594,741	216	309,439	956	.....	2,516	.....	.....	.....
Germany	473	460,565	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	.....
Belgium	1	554	.....	.....	.....	.....	.....	.....	.....	.....	22	.....	.....	.....
All other	550	515,834	732	633,951	596	494,325	2,650	2,069,429	457	.....	595	.....	.....	.....
Totals	33,001	33,521,504	34,609	33,946,432	30,997	36,537,475	33,443	35,997,006	22,304	18,400,000	32,726	26,400,000	23,214	14,600,000

(a) Conversions made from milreis at normal average pre-war rate of 1 milreis=$0.25. Allowance must be made for recent depreciated exchange.

TABLE 2

1920	United States Pounds	Europe Pounds	Total Pounds
January	6,273,039	.....	6,273,039
February	5,343,118	2,819,146	8,162,264
March	4,569,228	2,343,398	6,912,626
April	5,488,543	4,047,795	9,536,338
May	2,506,192	1,575,095	4,081,287
June	(a)	(a)	3,517,028
July	1,107,076	2,239,213	3,346,289
August	2,088,753	2,491,957	4,580,710
September	1,666,497	922,749	2,589,246
October	3,081,454	1,923,089	5,004,543
November	1,458,836	1,689,606	3,148,442
December	2,522,861	2,328,788	4,851,649
Total 1920	.....	.....	62,003,511
1921			
January	2,095,345	1,706,708	3,802,053
February	2,286,083	1,954,096	4,240,179
March	2,137,119	665,387	2,802,506
April	2,566,753	677,327	3,244,080
May	2,774,546	961,431	3,735,977
June	1,626,355	6,708,682	8,335,037
Total 6 months of 1921	13,486,201	12,673,631	26,159,832

(a) Figures not available.

During the war the proportion of Brazil's output sent direct to the United States greatly increased. The proportion of Brazilian production actually consumed in the United States did not necessarily increase as rapidly, for the increase in the ratio of American imports from Brazil to the total Brazilian exports was due to the growth of direct shipments from Brazil and other countries to the United States, at the expense of indirect shipments via England. In 1913, 46 per cent of Brazil's rubber exports went direct to the United States. In 1919 the proportion was 70 per cent. Great Britain was a close second before the war, with France a poor third. In 1919 these two countries received only 20 and 8 per cent respectively of Brazilian rubber exports. The rest of the world received about 2 per cent. However, in 1920, the proportions sent to Europe and the United States returned to approximately their pre-war relation. In the first five months of 1921 the exports to the United States greatly exceeded those to Europe, but very large shipments to Europe last June make the proportions about equal for the first half of the year.

Prices

Table 3 shows the New York spot prices of upriver fine Pará rubber from the Amazon and of first latex crêpe, one of the standard plantation grades from the East, from 1914 to 1921. The prices are in dollars per pound for the available date nearest the fifteenth of the month specified.

This steady decline in the price of rubber, except for temporary partial recoveries in 1915 and 1916, is most striking. The latest prices quoted, 20 cents per pound for upriver fine Pará and 14¾ cents per pound for first latex crêpe, mean a loss to many producers in the East Indies, and a crisis in the already bad economic system prevailing in Brazil. The present price of $0.20 per pound for upriver fine Pará is to be compared with an average of $2.15 per pound in 1910, when it was at its highest, and when the dollar was worth much more than it is now.

Economic

The overshadowing of Brazil's rubber industry by the scientifically managed rubber industry of the East Indies is likely to spell disaster for the former unless it is radically improved. The present low price is bad enough for the East Indian planters with their superior producing conditions. They are now trying the experiment of concerted limitation of output. But Brazil's industry, though the Brazilian Government has several times without success proposed a valorization scheme to raise artificially the price of rubber, is not at present susceptible of any centrally directed scheme to raise prices or limit output. Its production is too small a percentage of the world's production, in any case, even were its organization on a healthy basis, to attempt to mold supply and demand factors.

Four factors are dominant in preserving the present unsatisfactory rubber situation in Brazil. These handicaps and their more obvious remedies are briefly mentioned.

First is the inadequacy of the labor supply, together with the system of labor exploitation. There are not enough laborers in the rubber regions to prosecute the business of rubber gathering in a satisfactory manner. Some authorities recommend that

TABLE 3

	1914				1915				1916				1917			
	Jan.	Apr.	July	Oct.	Jan.	Apr.	July	Oct.	Jan.	Apr.	July	Oct.	Jan.	Apr.	July	Oct.
Upriver fine Pará	$0.73	.74	.68½	.63	.75	.58	.63	.54½	.86	.73	.66	.74	.77½	.76½	.68½	.64
First latex crêpe	.56	.63	.55½	.61	.86	.62	.63	.59½	.92	.82	.58	.61½	.80	.80½	.67	.63½

	1918				1919				1920				1921				
	Jan.	Apr.	July	Oct.	Jan.	Apr.	July	Oct.	Jan.	Apr.	July	Oct.	Jan.	Apr.	July	Aug.	Sept.
Upriver fine Pará	$0.58	.61	.68	.63	.60	.55	.55	.53	.49	.42	.34¾	.24½	.18	.16¾	.16½	.17	.20
First latex crêpe	.57	.60	.63	.59	.55	.49½	.40	.51	.53½	.45	.33	.24	.21½	.18¾	.16½	.15½	14¾

Orientals, either yellow or black, be imported. It is probable that this would increase output, reduce cost and improve the condition of the natives.

The second economic handicap is the insufficiency and high cost of food. The real remedy is planting suitable foodstuffs, and thus securing independence of food supply. The increased income thereby netted by the region could be used to buy household and agricultural necessities, estate supplies, ploughs, cultivators, etc.

High transportation rates are a third drawback. It is useless, perhaps, to hope for decreased charge in ocean transport, but the cost of river transport is susceptible of great reduction. Ships could be pooled and placed under a central administration. Through these measures the present transportation rates, which help keep high the cost of rubber production, would be considerably lowered.

The fourth principal defect is the high export duty on Brazilian rubber. This cuts into the price received by the rubber exporters, for Pará rubber must accept approximately the plantation rubber price established at New York.

With rubber at its present price, extinction faces the Brazilian rubber industry if it does not read the signs of the times and act accordingly. Thorough reorganization must take place.

Mineral Rubber[1]

By C. Olin North[2]

If the Tendency to Produce Logginess in Compounds Could Be Eliminated, Mineral Rubber Would Be More Extensively Used

MINERAL rubber, or MR as it is known in the trade, belongs to a great class of asphaltic products. In fact the first MR to be placed on the market in England several years ago was a variety of natural asphaltic pitch. Later it was found that the combination of this and similar substances with the harder bitumens, such as gilsonite, gave a product more in demand by the rubber industry.

Shortly after the introduction of this material, the asphalt and mixed base petroleums of the mid-continental and Mexican fields began to be developed. It was found that by blowing the still residues from these oils a material similar to the natural asphalts could be obtained. This, when mixed with gilsonite, gives a satisfactory MR. In practice it is customary to mix the gilsonite and still residue previous to blowing. Recently several firms have brought out MR produced entirely from still residue.

The various grades of MR now on the market have largely been developed with practically no cooperation between manufacturer and consumer. This is fundamentally wrong and neither producer nor consumer obtains the maximum from the material.

The purpose of this paper is to bring out the desirable and undesirable properties of MR for the benefit of those who use this material; that those who produce it may appreciate more fully how their product is employed and endeavor to prepare a more satisfactory material.

All grades of MR known to the writer are partially converted on vulcanization to an insoluble material. For the grade here investigated it has been found that subsequent to vulcanization only about 45 per cent of the added MR may be removed by acetone extraction and about 10 per cent by chloroform. The color of the chloroform extract gives a distinctive test for MR, being dark and fluorescent. Approximately 45 per cent becomes insoluble. The stocks employed with but one exception, consisted solely of rubber, sulphur, and the material under test, and the sulphur ratio was 10 per cent on the weight of the rubber. Fillers such as MR, carbon black, zinc oxide and barytes were standard high-quality materials added in definite volume ratios to 100 volumes of rubber.

Experimental Results

1. At low elongations MR is without stiffening action.

2. Up to 600 per cent elongation the individual stress-strain curves show hardly any increase in load but beyond that point the curves take a sharp right angle bend. Most of the load necessary for rupture is applied in the region from 600 to 900 per cent elongation. This is characteristic of pure gum stocks. In other words the stress-strain curves of stocks containing from zero to forty volumes MR per 100 volumes of rubber are quite similar.

3. Load at break—tensile strength—increases up to 7 volumes of MR and then falls off slightly. The slight fall off indicates that MR is without overloading tendencies.

4. Tensile at break—corrected to area at break—accents the desirable properties of MR. The range of greatest efficiency is from 3 to 15 volumes and the maximum is reached at about 7 volumes MR to 100 volumes of rubber.

5. The gas-black curve at 300 per cent elongation shows a straight line stiffening action very different from the 300 per cent elongation curve for MR, which is flat.

6. The gas-black load at break curve is much higher than MR but, due to higher ultimate elongation—greater necking down of the MR test pieces, the tensile at break curve for black is somewhat lower than for MR.

The conclusion is that MR in small quantities, certainly to 10 and for many purposes 15 volumes to 100 volumes of rubber, has a beneficial effect on rubber. Beyond this point it behaves as a diluent, but a harmless one so far as the stress-strain curve is concerned.

Stress-Strain Data at 100 Per Cent Elongation

The work at 100 per cent elongation is important because in actual service we seldom get much higher elongations; for example, in tires and tubes 100 per cent probably represents the upper limit of flexing.

Energy Input

The hysteresis loops were run to a constant load of 20 kilograms per square centimeter. By measuring the area under the up-curve and converting it to energy units of kilogram centimeters per cubic centimeter the energy input is obtained. This corresponds to Wiegand's energy of resilience but is limited to the lower portion of the curve. It is this portion of the curve in which we have the greatest interest. The energy input, or capacity to absorb energy, shows a maximum at 7 volumes MR beyond which there is a gradual falling off.

Permanent Set

By permanent set we mean irreversible flow whether it be plastic or merely due to change in position of the particles of filler. The test employed in these experiments was purposely designed to measure irreversible flow. It is well known that successive stretching, producing an internal readjustment within the test piece, greatly increases the tensile strength and also brings out the maximum permanent set.

[1]Abstract of paper read before the Rubber Division of the American Chemical Society, New York, N. Y., September 6-10, 1921.

[2]Development department, The Goodyear Tire & Rubber Co., Akron, Ohio.

The stretch was placed at 60 per cent of the ultimate elongation because it was found that most compounds could be repeatedly stretched to this elongation without having them develop flaws and fail prematurely. MR behaves as a super-cooled liquid. Its plastic flow is reversible. Its curve lies considerably below those shown for black, zinc oxide and barytes.

There is a peculiar relation between permanent set and hysteresis loss as measured in this experiment. In both these tests adequate time for plastic flow is provided. The curves of hysteresis loss and permanent set are practically straight lines.

Resilience

This term was first applied in rubber testing by W. B. Wiegand. It represents the energy which has been absorbed or put into the test piece on being stretched to the point of rupture and is determined by measuring the area between the curve and the elongation axis. For purposes of convenience we convert this area into energy units, kilogram centimeters per cubic centimeter.

Up to five volumes of MR the curve is a straight line, showing that within these limits MR does increase the energy absorption capacity of the stock. Beyond this point there is a slight falling off. However, the remainder of the curve is a straight line. This is another illustration of the peculiar inertness of MR when employed beyond the point of its maximum efficiency. As far as the writer can determine, the only evidence of its presence in large quantity is in a slight raising of abrasion loss, and logginess.

Abrasion Loss and Penetration

The abrasion loss increases with increased MR. Penetration tests show that there is little if any change in hardness of the stocks with increase in MR.

Rate of Plastic Flow

It is conclusively shown that MR does increase the plastic flow of stocks containing it. The amount of this flow depends on the quantity of MR present and on the load applied. The rate of plastic flow appears to be quite susceptible to temperature change.

Recovery

The flow of MR is reversible. MR behaves as a true supercooled liquid. The test pieces used in elongation under constant load experiments were measured at intervals after the recovery noted.

The general conclusion from these experiments is that MR does not greatly retard the ultimate recovery. However, it introduces a time factor in that the recovery within the first minute or two after release is considerably retarded when over 15 volumes of MR are introduced. In other words, MR being a viscous or supercooled liquid flows with the rubber when strained and is forced back by the contraction of the rubber when released. It behaves like a door check. It only appreciably prevents ultimate recovery but it has a decided damping effect on immediate recovery.

It is because of this property that loaded stocks containing MR are frequently loggy or sluggish. In many cases this is a serious defect. For example, consider a high MR solid tire tread. In service it receives shocks of more or less magnitude all the time. If the speed is such that the tire cannot regain its original contour from blow to blow, the effect is to strain the stock in progressively increasing amounts until the elastic limit is approached and failure begins. Such a tread flattens down, cuts, and gives very low mileage. In pneumatic tire treads, high MR produces logginess which in turn causes tread separation and excessive wear.

This is the chief criticism of the MR of today. If it were possible to alter its physical properties so as to eliminate the tendency to produce logginess, there is little doubt that such mineral rubber would be more extensively employed and in larger quantities.

Summary

MR has a beneficial effect on the physical properties of rubber when employed in proportions from 3 to 15 volumes to 100 volumes of rubber. The maximum effect is found at 7 volumes per 100 volumes of rubber. This statement is proved by experiments on tensile at break, energy, input, and resilience. Beyond 15 volumes to 100 volumes of rubber, MR is practically inert as is shown by stress-strain curves, ultimate elongation, energy input, and resilience.

MR is essentially a plastic material and while it is subject to considerable plastic flow, very little of this flow is irreversible. This is demonstrated by: hysteresis loss in experiments in comparison with black and zinc oxide, permanent set experiments, elongation under constant load, and recovery.

A remarkable agreement is shown by a comparison of the slopes of the curves for permanent set with hysteresis loss for MR, zinc oxide and gas black.

When present in compounds in excess of 15 volumes of MR to 100 volumes of rubber, a decided logginess is imparted. The limit at which logginess first appears is considerably dependent on the quantity of other filler present. In pure gum 15 volumes is the limit. This logginess is simply a slowing up of the recovery. MR thus acts similarly to a door check and while the eventual recovery is the same as for pure gum, this is a most serious objection to more extensive use of MR. In service, complete recovery from blow to blow is prevented and the effect of successive impacts becomes more serious than if the stock had the property of rapid recovery.

EVANS' HYSTERESIS MACHINE

The following description of the Evans hysteresis machine is taken from C. O. North's paper on MR, read at the recent New York meeting of the American Chemical Society.

Stress-strain data at low elongations and hysteresis loops were obtained on a machine developed by W. W. Evans, of the Goodyear Research Laboratories. The machine consists essentially of a large balance. One arm carries a bucket into which water flows at a definite predetermined rate—2 kg. per minute.

By means of a floating siphon an outflow of 1 kg. per minute is maintained, making the rate of loading 1 kg. per minute. On the return or down curve of the hysteresis loops it is only necessary to shut off the inflow of water, when the release of the load is at the rate of 1 kg. per minute. The test piece is attached to the other arm and the lower mark kept to a certain point by means of a small windlass.

The method of adding load is unique. It is believed that much of the non-agreement of usual stress-strain data is due to the fact that standard test conditions have not been maintained. In the ordinary testing machine the uniform motion of one jaw does not mean that all different specimens of even the same stock are tested in exactly the same manner. In the Evans machine all specimens are subjected to exactly the same rate of increase of tension per unit area of cross-section. This condition is secured by changing the position of the bucket on the arm of the balance to correspond to the cross-sectional area of the test piece. For example, with an area of 0.5 sq. cm. and a rate of 1 kg. per minute, the bucket and the test piece being hung at 100 cm. from the knife edge, the tension is 2 kg. per sq. cm. per minute. Should the next specimen have an area of 0.49-sq. cm., the bucket is hung at 98 cm., the test piece remaining at 100 cm. from the knife edge, and the rate of loading remains constant at 2 kg. per square centimeter per minute. Highly gratifying results have been obtained with this machine.

What the Rubber Chemists Are Doing

Methods of Rubber Analysis[1]

For the analysis of vulcanized rubber the sample is cut up fine or ground between closely adjusted mixing rolls. This results either in a powder to be used directly for analysis, or in a thin sheet that is cut up again. Samples of ebonite are filed to a powder. All analyses are made in duplicate.

In the acetone extract the following determinations are made: free sulphur; non-saponificable parts—mineral oils, paraffine and ceresin.

In the residue from the acetone extract the following determinations are made: total combined sulphur; sulphide sulphur; compounding ingredients insoluble in petroleum: sulphate sulphur; carbon black; factice acids.

In the original sample the following determinations are made: ash; total sulphur; qualitative tests on asphalt and such like compounds.

Acetone Extract

After extracting 5 g. for 10 hours in a Soxhlet apparatus, the acetone is distilled off and the acetone extract dried to constant weight at 105 degrees C.

Free Sulphur

To the above extract 25 cc. strong nitric acid (sp. gr. 1.4) is added, a small funnel is put in the neck of the flask and the liquid gently boiled for 30 minutes. After cooling, the content of the flask is diluted with water to 100 cc., filtered off, and the filtrate evaporated adding a little sodium chloride. When nearly dry, 5 cc. hydrochloric acid is added and evaporated to dryness. The residue is dissolved in water, filtered off and acidified with some hydrochloric acid. In the filtrate the sulphur is precipitated as barium sulphate.

When the percentage of sulphur is higher than one per cent no complete oxidation is obtained, part of the sulphur remaining in the flask in the form of small globules[2]. In such case this sulphur is weighed as such. By boiling and inclining the flask, the globules may be united, the ball of sulphur is taken out and dried for one hour in a drying stove at 95 degrees C. and then weighed. The total amount of free sulphur is then found by adding this weight to the sulphur precipitated as barium sulphate.

Non-saponificable Parts—Mineral Oils, Paraffine and Ceresin

Add to the acetone extract 25 cc. alcoholic potassium solution (about 0.5 N.), heat for 30 minutes, dilute with 25 cc. water and boil again for a moment. After cooling, the contents are poured into a separating funnel, rinsing the flask first with 50 per cent alcohol and then with petroleum ether several times and adding this to the contents of the separating funnel. After shaking, the petroleum ether extract is transferred to a weighed flask, evaporated to dryness and weighed. The increase in weight is the weight of mineral oils, paraffine and ceresin.[3]

The paraffine and ceresin can be determined by dissolving the contents of the flask in 50 cc. boiling absolute alcohol, filtering and washing the filter with 25 cc. boiling absolute alcohol. This solution is then treated according to the modus operandi mentioned in the next paragraph, which applies especially when only paraffines are to be determined in the acetone extract.

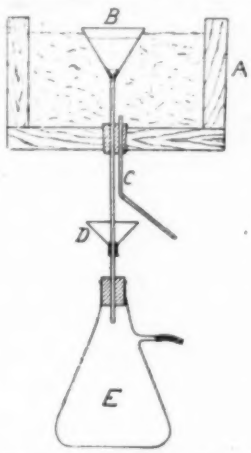
[1]The Principal Methods of Chemical Analysis as used at the Netherland Government Rubber Institute, Delft, Holland. Edited by the Institute.

[2]The oxidation may be promoted by adding a knife point of potassium chlorate. If the free sulphur amounts to little more than one per cent, all sulphur is dissolved in that way.

[3]Some rubber resins are non-saponificable and if present may increase the percentage of mineral oils.

Paraffine and Ceresin

The acetone extract is dissolved in 50 cc. boiling absolute alcohol and filtered. Filter and flask are washed with 25 cc. boiling alcohol.



Filter for Paraffine Hydrocarbons

The filtrate after having slowly cooled is put for one hour in a refrigerating mixture of — 4 to — 5 degrees C., when paraffine hydrocarbons, if present, separate. These are filtered and washed with about 100 cc. of 96 per cent alcohol of the same temperature. The apparatus in use for this filtration is seen in the illustration. It consists of a wooden basin *A* which is filled with a refrigerating mixture of — 4 to — 5 degrees C., which prevents dissolving of the paraffines by increase of temperature during filtering off. *B* is a funnel with platinum cone and filter, *C* a glass tube for discharge of water. *D* prevents water from coming in contact with flask *E* in which the filtrate is collected.

What remains on the filter is then put back into the original flask by pouring over it boiling alcohol and carbon bisulphide. The dissolving medium is then evaporated and the residue weighed after drying at 100 degrees C. This is considered to consist of paraffine and ceresin with traces of free sulphur. Eventually free sulphur can still be determined by the method previously mentioned, and the weight of paraffine diminished thereby, but for technical analysis this may be omitted.

Total Amount of Combined Sulphur

One gram of the residue is placed in an Erlenmeyer flask of 200 to 300 cc., with 40 cc. nitric acid, specific gravity 1.4, and six g. magnesium nitrate free of water, and gently heated till foaming, after which the flame is withdrawn. When the foaming abates gentle boiling takes place for one hour, after which two drops of bromine are added and boiling is continued for 30 minutes.

The liquid is then transferred to a porcelain dish and evaporated almost to dryness. Ten cc. hydrochloric acid is added and the evaporation continued till the mass becomes solid when the porcelain dish is taken from the water bath. The residue is then taken up in hot water and filtered, and in the filtrate the sulphur is determined as barium sulphate in the usual way.

Should insoluble sulphates remain on the filter, these are fused with sodium potassium carbonate and the sulphur determined in the usual way.

Sulphur Present as Sulphide

One gram of the residue is placed in an Erlenmeyer flask of 200 cc. and covered with 20 cc. ether. The flask is closed by a stopper through which passes a tube funnel for 25 cc. and a bent glass tube. After one hour when the rubber is considerably swollen, the air is expelled by a current of pure hydrogen and 25 cc. of hydrochloric acid added. The sulphuretted hydrogen is expelled by gentle heating and the decomposition completed by boiling for about five minutes. After heating, a current of hydrogen is passed through for about 15 minutes to expel the last traces of sulphuretted hydrogen. The sulphuretted hydrogen is taken up in an excess of iodine solution of known strength, about one-tenth

N., and the remaining iodine is titrated back with sodium thiosulphate (one cc. one-tenth N. iodine equals 1.7 mg. hydrogen sulphide).[4]

Compounding Ingredients Insoluble in Petroleum

One gm. of the residue[5] is put in an Erlenmeyer flask of 100 cc. with 25 cc. of a petroleum fraction of b. p. 230 to 260 degrees C. (distilled from ordinary lamp oil) and gently boiled on a sand bath or on a wire gauze. A long glass tube is acting as reflux condenser for the petroleum vapors. Heating is continued till the rubber is completely dissolved, which usually takes place after 1 to 2 hours[6]. After the liquid has cooled down, benzene is added up to 100 cc. and the compounding ingredients are separated by centrifuging in weighed tubes. When the precipitate has well deposited itself, the clear liquid is decanted. It is washed a few times with benzene and the tubes are dried at 105 degrees C. to constant weight.

Sulphate Sulphur

The compounding ingredients are treated with dilute acid, sulphide sulphur, if present, being expelled as sulphuretted hydrogen. The liquid is filtered off and in the filtrate the soluble sulphates, if present, are determined in the usual manner. The compounding ingredients remaining on the filter are fused with sodium potassium carbonate, and sulphates are determined in the usual way, if present.

Carbon Black

One gram of residue is put into a beaker with 40 cc. nitric acid, specific gravity 1.4, and heated on the water bath till the rubber is dissolved. Filter over asbestos in a Gooch crucible and wash with 50 cc. hot nitric acid, 100 cc. hot water, 50 cc. acetone[7], and dry at 105 degrees C.

After weighing, incinerate and weigh again. The difference of the two weights is carbon black.

Factice Acids

Two grams of the residue, immediately after acetone extraction and drying, is covered by 20 cc. benzene and left for one night; 40 cc. alcoholic potash, half N., is added next day and the liquid boiled on the water bath for four hours, using a reflux condenser. Filter and wash the residue a few times with boiling alcohol and then with boiling water. Filtrate and washing liquids are evaporated together almost to dryness and 3 to 5cc. poured into a separating funnel, acidified with hydrochloric acid, and extracted two or three times with ether. The ether extracts are poured into a tared Bernthrop flask, the ether distilled, and the flask dried at 105 degrees C. The increase in weight gives the percentage of factice acids. When asphalt and such like materials are present, the figures are not reliable, as the asphalt also yields an extract with alcoholic potash. In this case a preceding extraction with carbon bisulphide for ten hours is advisable before determining the factice acids.

Ash

Three grams of the original sample is incinerated, as for crude rubber, in a porcelain crucible. This is placed in a closely fitting hole in an asbestos sheet, so that the flame cannot come into direct contact with the contents. Heating is started with a small Bunsen flame and after the volatile hydrocarbons have been distilled off the flame is increased and the incineration finished on a triangle.

[4]This method cannot be used when vermilion (HgS) is present, as this does not dissolve in hydrochloric acid. When antimony pentasulphide (golden sulphur) is present, errors occur, as the pentasulphide decomposes under separation of sulphur.

[5]It is necessary to use the extracted material, as otherwise, during the boiling with petroleum, free sulphur may react with the mineral compounding ingredients, for example, zinc oxide.

[6]Sometimes with hard rubber objects, such as floor tiles, this may take longer. In most cases ebonite does not dissolve, even on prolonged boiling.

[7]If lead is present, wash with a solution of ammonium acetate, and then with water and acetone.

Total Sulphur

It may be useful to determine the total sulphur in the original sample, in order to have a check on the free and the combined sulphur. The method is identical with that followed for the total amount of combined sulphur.

Qualitative Analysis on Asphalt, Tar and Similar Compounds

One gram of the original sample is covered with nitrobenzene, pyridine, xylene or carbon bisulphide. Dark-brown coloring or fluorescence of these liquids indicates tar, pitch, asphalt, etc. A quantitative analytic method for these ingredients in vulcanized rubber satisfying moderate desires is still to be wished for.

Caoutchouc Hydrocarbons

These can be determined only indirectly, by deducting from 100 the total of the percentages of sulphur, compounding ingredients, substitute mineral oils, and paraffine. This method is subject to fairly grave errors. Moreover no answer is given to the query as to whether these caoutchouc hydrocarbons originate from crude rubber, reclaimed, or old ground rubber.

Vulcanization in Solution with and Without Accelerators[1]

The following abstract of the work of M. Le Blanc and M. Kröger is taken from the *Journal of the Society of Chemical Industry*.[2]

Experiments were made on four qualities of Hevea rubber, I., II., IV., and VI., by the sulphur chloride process, the hot sulphur process, and the Peachey sulphur dioxide and hydrogen sulphide process, without and with accelerators. The process of the vulcanization was followed, according to the process used, by observations on the syneresis phenomenon, by observing the time taken for gel formation to reach a specified stage, or by viscosity measurements. The syneresis experiments on cold vulcanization with sulphur chloride in benzene showed that the phenomenon—the separation of liquor from the gel—did not start until sufficient sulphur chloride was present to form Hinrichsen's compound, $C_{20}H_{32}S_2Cl_2$. The analogous phenomenon of flocculation which occurs in more dilute solutions follows the same rule.

The concentration limit in benzene, for example, between solutions which will gel and those which merely flocculate depends on the previous treatment which the rubber has had. If it has been heated for some hours at 130 degrees C., a 3 per cent solution is needed for gel formation, whereas before heating, a 1 per cent solution will gel. This limiting concentration appears to have an important connection with the mechanical properties of the rubber, in the sense that bad mechanical properties are associated with a high limit. Working the raw rubber raises the limit. This limiting concentration also depends on the temperature, and consequently the determination of the effect of temperature on rapidity of gel formation under definite conditions of concentration is complicated.

The velocity of gel formation, that is, of vulcanization, also depends on the solvent, increasing as the viscosity of the solution decreases and as the dielectric constant of the solvent increases. This is to be accounted for by the depolymerizing action of the solvent on the rubber molecules. Comparative experiments with the four varieties of rubber examined in 1 per cent benzene solution at 20 degrees C. with sulphur chloride showed decreasing rate of vulcanization from Hevea I. to Hevea VI. Experiments on hot sulphur vulcanization were made in tetralin solution at 140 degrees C. Much higher concentrations of rubber, at least 10 per cent, were needed to get gel formation and, to get results in any way comparable with one another, it was necessary to depolymerize the rubber by boiling the solution for some time before adding the sulphur. The course of the vulcanization

[1]M. Le Blanc and M. Kröger. Z. Elektrochem., 1921, 27, 335—358.
[2]September 30, 1921, pages 667-668A.

process appears to be similar to that when sulphur chloride is used, a fall in viscosity followed by gel formation.

Results of experiments on the change of viscosity during cold and hot vulcanization are recorded. To investigate the Peachey process experiments were made on the rate of precipitation of sulphur from benzene solutions of sulphur dioxide and hydrogen sulphide with and without different accelerators. Such substances as quinoline, nicotine, *p*-nitrosodimethylaniline, and *p*-aminodimethylaniline accelerate the precipitation, but not in the order of their effectiveness as accelerators for vulcanization. In presence of rubber, however, the reaction $2H_2S+SO_2=3S+2H_2O$ proceeds rapidly in benzene solution, and, from the results of syneresis experiments, the compound formed appears to be $C_{20}H_{32}S$. This explains the relatively small quantity of sulphur needed for vulcanization by the Peachey process, since, according to Hinrichsen, ordinary hot vulcanization results in the formation of a compound $C_{20}H_{32}S_4$.

The effect of accelerators is generally to lower the viscosity of the rubber solution, and it was found possible to make quantitative comparison of the influence of different accelerators by the syneresis and gel formation methods. By this means it is possible to determine in a simple manner whether a particular substance will be of any value as an accelerator. This applies to vulcanization with sulphur chloride in the cold or with sulphur in the hot. In the Peachey process the usual accelerators have a retarding effect, since they cause the precipitation of the sulphur in an insoluble form. The influence of accelerators is also less in solvents having a high dielectric constant, probably because the solvent itself has already played a part by depolymerizing the complex rubber molecules.

Acceleration of Vulcanization by Organic Accelerators[1]

The following condensed account of the effect of organic accelerators on vulcanization is from the *Journal of the Society of Chemical Industry*[2].

In the presence of powerful organic accelerators such as secondary aliphatic amines and thiouram mono and disulphides, satisfactory vulcanization can be obtained with as little as 1.4 per cent of sulphur calculated on the rubber, and in ordinary technical work using such accelerators, it may be necessary to adjust the proportion of sulphur in the unvulcanized mixture. Of all metallic oxides, zinc oxide is most effective in increasing the activity of the accelerator; lead oxide is less effective, while the action of the alkaline-earth oxides and antimony oxide is negligible. Aromatic monoamines and phenol do not aid the accelerator except in the presence of lead oxide. A suitable proportion of accelerator is 0.25 per cent, calculated on the rubber, irrespective of its molecular weight, while for effective vulcanization there should also be at least 0.85 to 1.5 per cent of zinc oxide or 3.5 to 7 per cent of litharge.

The marked accelerating power of the reaction product of carbon bisulphide and dimethylamine is due to the formation, during vulcanization, of an exceedingly active zinc or lead compound. The crude reaction product is not a pure substance, but consists of tetramethylthiourea, approximately 20 per cent, dimethylamine dimethyldithiocarbamate approximately 30 per cent, and tetramethylthiouram disulphide approximately 50 per cent, the first-named being inactive, while the other two, in the presence of zinc oxide or lead oxide, are powerful catalysts. The disulphide, which if used in sufficient quantity can effect vulcanization without the additional presence of sulphur, by treatment with potassium cyanide can be converted into tetramethylthiouram monosulphide, which exhibits comparable acceleration of vulcanization.

The process by which these substances exert their accelerating power involves the formation of the zinc or lead salt of the dimethyldithiocarbamic acid. It is remarkable that the action of the oxides of the alkaline-earths on the thiouram mono or disulphide gives rise not to the corresponding dimethyldithiocarbamates but to inactive tetramethylthiourea and carbon bisulphide, thus providing an explanation of the ineffectiveness of these oxides relative to zinc oxide.

Diphenylthiouram disulphide, zinc diphenyldithiocarbamate, ammonium phenyldithiocarbamate, and ammonium dithiocarbamate also decompose with formation of relatively inactive products, such as diphenylthiourea, and so possess no marked accelerative action. The view as to zinc alkyldithiocarbamates forming essential intermediate products is confirmed by the fact that the isolated zinc dimethyldithiocarbamate in the presence of a little zinc oxide is more than ten times as powerful an accelerator as the corresponding secondary amine or tetramethylthiouram disulphide without zinc oxide. Similar results were obtained with other bases and their corresponding derivatives, for example, piperidine, diethylamine, ethylamine, di-isobutylamine, di-isoamylamine, and benzylethylamine. Tetramethylthiouram disulphide does not appreciably affect the surface tension of molten sulphur, but zinc dimethyldithiocarbamate markedly reduces it.

Among the technical possibilities with powerful organic accelerators is the production of two "solutions," one containing rubber and sulphur and the other containing rubber, zinc oxide, and the accelerator. By mixing these and evaporating it is possible to obtain films which will vulcanize at 100 degrees C. Indeed, with similar mixtures containing 6 to 8 per cent of sulphur and 10 to 20 per cent of zinc oxide, it is possible to observe vulcanization at the ordinary temperature.

[1] A. Maximoff. Le Caoutchouc et la Gutta Percha, 1921, 18, 10,944—10,947, 10,986—10,988.

[2] September 30, 1921, page 668A.

CHEMICAL PATENTS

The United States

RUBBER COMPOSITION AND METHOD OF MAKING IT.—The composition consists essentially of rubber and celluloid.—Nicolas Walch, Newton Highlands, assignor to Erwa Chemical Manufacturing Co., Needham, Massachusetts. United States patent No. 1,392,240.

COATING AND IMPREGNATING AGENT AND PROCESS OF MAKING IT.—A metallic oleate is heated to a high temperature and a quantity of india rubber is dissolved therein. The compound is heated to a still higher temperature and steam is blown through it. On subsequent reduction of the temperature the composition is dissolved by the addition of a solvent.—Andrew J. Rowland, assignor to The Federal Products Co., both of Cincinnati, Ohio. United States patent No. 1,393,832 and No. 1,393,833.

The United Kingdom

TIRE FILLING COMPOSITIONS. SLAKED LIME IS USED AS A hardening ingredient in a composition containing a vegetable oil and sulphur chloride. "Soap oil," which is a mineral oil boiling at about 270 degrees F., may be added to delay vulcanization until the product has been molded, and coloring matter may be added. —J. Maina, 65 Holborn Viaduct, London. British patent No. 167,235.

PUNCTURE-SEALING COMPOSITION CONSISTING OF TURKISH bird lime, methylated spirit, diatomaceous earth, water, and, optionally, borax, shellac and perchloride of mercury. A preferred form of tire comprises two inner tubes, one within the other, with a film of the composition between them, and a movable fluid mass of the composition within the innermost tube.—C. A. Cleghorn, East Molesey, Surrey. British patent No. 167,261.

FIBROUS COMPOSITION COMPRISING FROM 50 TO 90 PER CENT OF wood flour incorporated with rubber and sulphur, the mixture being vulcanized by heat and pressure.—W. Eaines, 9 Fishergate Hill, Preston. British patent No. 167,716.

USE OF RUBBER IN PAPER MAKING. LATICES OF RUBBER, GUTTA and balata are added, separately or together, to paper pulp during manufacture. The materials may be beaten up with the pulp and after the addition of a coagulating agent such as acetic or formic acid or other suitable organic or mineral acid or mineral salt, made into paper, mill-board, etc., in the ordinary way. The paper may be vulcanized by the Peachey process described in British patent No. 129,826, or other suitable process.—F. Kaye, Ashton-on-Mersey, Cheshire. British patent No. 167,935.

PLASTIC COMPOSITIONS, CONSISTING OF PLASTER, TALC, AND fibers of paper, wood or rags, mixed together and an aqueous solution of gelatine added. The mixture is heated to a temperature between 25 and 70 degrees C., and small quantities of soap solution and glycerine, and, in some cases, of rubber solution, are added. Objects molded or stamped from the composition are hardened after preliminary drying by immersion in a solution of formaldehyde and alum and are subsequently dried at between 20 and 70 degrees C.—L. A. Deleglise, 25 rue de l'Amiral Bruix, Boulogne-sur-Mer, France. British patent No. 168,445.

New Zealand

PNEUMATIC TIRE CONSISTING OF AN ADMIXTURE OF ANY STRONG fibrous material with rubber, sulphur and some accelerating agent such as magnesia or litharge. If desired the admixture may be felted, shaped to the profile of a tire, the two ends may be joined together and the tire so formed subsequently vulcanized.—Wilfred K. Hughes and Samuel G. Pirani, both of Melbourne, assignees of Edward W. Thurlow, Brighton, both in Victoria. New Zealand patent No. 45,777.

Australia

HARD RUBBER SUBSTITUTE CONSISTING OF A MIXTURE OF HARD rubber dust, phenol formaldehyde condensation products and cresol in intimate mixture heated for 15 minutes only at 120 to 130 degrees C. The finished product may be molded into any form desired, such as surgical instruments, telephone mouthpieces, etc.—Australian patent No. 83,275.

Norway

RECLAIMING RUBBER IS EFFECTED BY RULLING IT OUT TO A FILM at least 20 times so that it is completely opened out and may be used anew and vulcanized either by itself or in combination with new rubber or fillers.—Hermann Penther. Norwegian patent No. 31,274.

OTHER CHEMICAL PATENTS

Germany

Patents Issued with Dates of Issue

No.
342,365 (February 17, 1920) Manufacture of substances similar to hard rubber. Plauson's Forschungsinstitut G. m. b. H., Hamburg.

343,181 (June 9, 1920) Method of vulcanizing rubber. Stanley John Peachey, Davenport, near Stockport, England; represented by R. Ceissler, Berlin, S. W. 11.

SOFT FLOUR SULPHUR

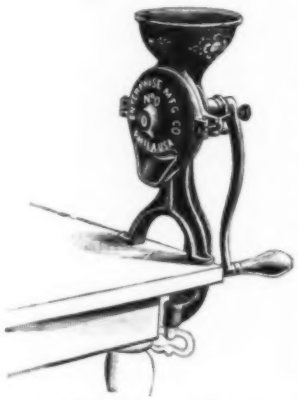
By a special refining process there is now produced a soft flour of sulphur particularly adapted for use in rubber compounding because it is not only 100 per cent pure and absolutely acid-free but its softness, due to the entire absence of crystalline particles, makes it especially superior for intimate mixing with rubber to produce a uniformly vulcanized product.

REPLETE WITH INFORMATION FOR RUBBER MANUFACTURERS—H. C. Pearson's "Crude Rubber and Compounding Ingredients," also "Rubber Machinery."

LABORATORY APPARATUS

Laboratory Grinding Mill

The hand-power grinding mill recommended by the Joint Rubber Insulating Committee for use in grinding vulcanized rubber and insulating compounds for analysis is shown in the illustration. It comes in various sizes and is adjustable after the manner of a coffee grinder. The front is hinged to open for cleaning out the mill interior.—The Enterprise Manufacturing Company Philadelphia, Pennsylvania.



Rubber Sample Grinder

Laboratory Suggestions

A convenient method for plainly indicating a given capacity on a graduate is to place an elastic rubber band at the level wanted. It is easier to fill the glass with liquid to that point than to read the graduation because the rubber band is more visible. This device is suitable only where approximate quantities are desired and is then decidedly helpful.

Thermostat for Rubber Laboratories

The illustration shows a very practical laboratory thermostat of the expanding capsule type for use alone with any electrical heating medium which does not require more than three or four amperes. It may be used on either 110 or 220-volt, alternating or direct current, and for temperatures from 0 to 160 degrees C.

A & S Thermostat

The capsule must be within the heated chamber and the stem of the regulator may be longer or shorter depending upon the length of the tubulation into which the stem must be inserted, that is, tubulation from the outside of this utensil through the air jacket, water jacket, etc., to allow the thermostat base to rest on top of this tubulation or incubator. It is for use on ovens, water or oil baths, whether disk heaters, resistance coils or lamps are used for the heating medium.—Apparatus & Specialty Co., Lansing, Michigan.

GOVERNMENT HELIUM PLANTS NOW IN OPERATION

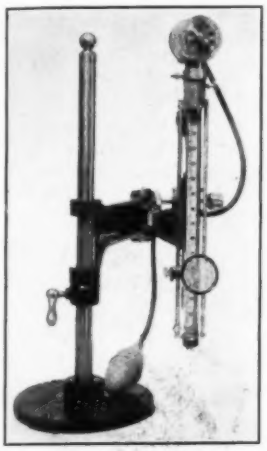
Helium, the non-inflammable gas now used for inflating balloons, was originally detected in the sun by means of a spectroscope. Small quantities of this gas were later extracted in the United States from the earth's atmosphere, while comparatively recently came the discovery that a small percentage of the natural gas that was flowing from wells at Petrolia, Texas, was helium. The experimental plants then built by the Government at Forth Worth and Petrolia have expanded until now they are in practical operation.

It costs the United States approximately 20 cents a cubic foot for the production of more than 290,000 cubic feet of helium a month at the Fort Worth plant, the only one of its kind in the world.

New Machines and Appliances

Shore Improved Scleroscope

THE improved form of scleroscope designated as Model C-1 is shown in the illustration. This instrument, widely used as a standard for determining the hardness of metals, may also be used for measuring the hardness of vulcanite and the resiliency of soft rubber such as tires, valves, etc. For this purpose an all metal hammer is substituted for the diamond-tipped one employed for testing the hardness of metals.



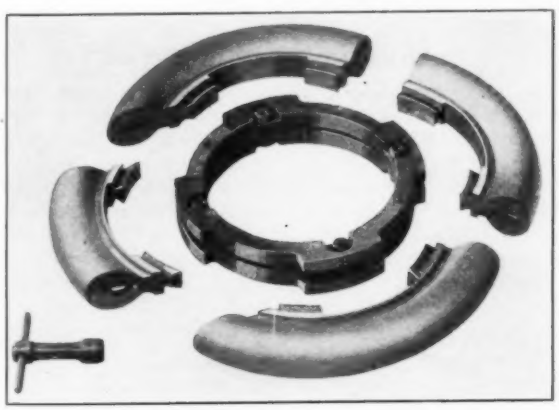
Scleroscope—A New Model

Among the features characterizing the latest type of this instrument are: a special fine screen for eliminating dust from the operating mechanism; the leather operating piston formerly used has been replaced by one of tungsten steel, which is practically indestructible; the former rigid adjustment of the hammer-hook mechanism has been replaced by a flexible adjustment which also greatly prolongs the life of the glass tube; the hammer hooks have been provided with shock shoulders, which eliminate breakage or disalinement of these parts. In addition, more highly perfected glass tubing is being employed.

The refinements mentioned render the instrument perfect for laboratory use under all conditions and speeds.—The Shore Instrument & Manufacturing Co., Jamaica, N. Y.

Interlocking Collapsible Cores

The illustration shows the Welton interlocking collapsible core which has all the features common in modern cores, with the added advantage of quickness of operation and lightness of weight.



The Welton Collapsible Core

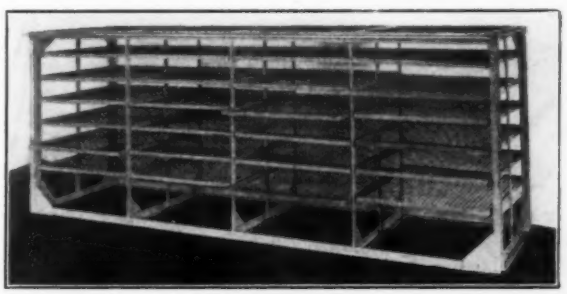
In order to take apart the core, it is necessary only to loosen the four nuts on either side of the core, shift the rings one-eighth of a turn and remove from the core. The core can be assembled by placing the segments together on the tire-stripping table and reversing the process.

The core is comparatively light in weight because of metal removed from the core as well as the rings between the lugs. The rings are made standard for any particular size and can be replaced independent of the core or vice versa. This is an ideal building core for cord tires, as the tire can be removed from the building stand without removing the rings from the spider.—The Cleveland Rubber Mold Foundry & Machine Co., Cleveland, Ohio.

Metal Drying Racks

Book Rack

Drying racks of some sort, often home made, are found in nearly every rubber factory. Two new forms of all metal racks for rubber drying purposes are pictured in the accompanying illustrations. One shows a stationary angle-iron frame arranged to hold four banks of six wire screen trays each. These slide in or out from either side on suitable metal runs. The top of the rack also is covered with wire cloth, presenting additional drying surface. The other illustration shows a similar rack for drying trays, mounted as a truck.—The Portage Iron & Wire Co., Akron, Ohio.



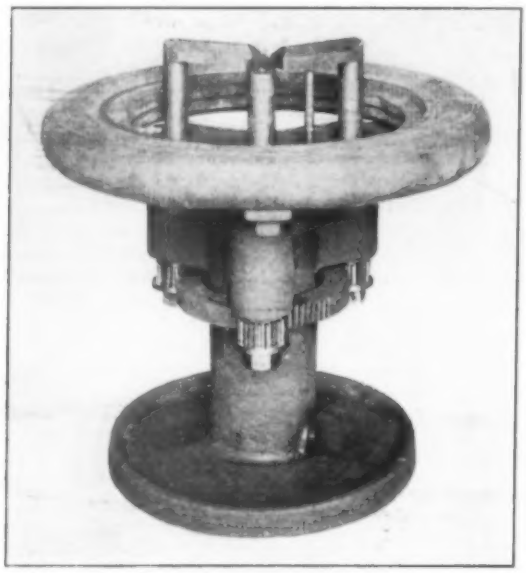
Drying Rack

Tire Rimming Press

An improvement over the common type of rimming press is pictured in this illustration where an uncured tire is shown in place with the operation of setting the beads completed and the tire ready for removal.

In the case of an extra heavy tire, pressure can be applied to the ram, lifting the three-arm platen to its highest position, the hooks disappearing within the platen. This gives an unobstructed table for placing or removing the tires. When the tire is placed on the table the platen is dropped, and the arms or hooks are swung outward, covering the base ring.

The advantages of this type of press are that there are no overhead obstructions nor outside rods. The operator may stand



The Allen Rimming Press

in one position and observe any part of the tire. In addition the three-armed construction of the platen gives freer access for the clamping of the rings.—Allen Machine Co., Erie, Pennsylvania.

Vulcanization Timing and Signaling Instrument

An electric timing and signaling instrument containing no clock mechanism or other delicate parts is shown in the illustration. It is connected, like an electric fan, to any convenient alternating current. The instrument indicates with regard to the timing of a process: (1) the total time, (2) time elapsed, (3) balance of time to continue, and (4) automatically signals completion of process. The instrument is for use in all manufacturing processes when time is a factor, as in vulcanization, etc.

Stromberg Electric Timer

The method of using the instrument is as follows: The setting hand is set to show the period of time of the process. The indicating hand starts from the point at which the instrument has been set and travels to zero.

The button marked "Change" is for setting the instrument for any length of process desired. Pushing it in and then turning this button sets the instrument for a new length of process. Turning this button also causes the setting hand to move, resetting to any new length of process.

When the indicating hand reaches zero and the signal is given, that process is completed. The operator pushes the "Set Back" button which causes the indicating hand to throw back quickly to starting point, at which the instrument is set.

The indicating hand then remains stationary at the starting point until the operator is ready to start a fresh process, at which time he presses the "Start" button which releases the indicating hand and causes it immediately to begin to travel towards zero, in correct relation to time.

The instrument is driven by a very small synchronous motor, known as the Warren motor.

The motor is self-starting, simple and reliable, and is in continuous operation. The instruments are thus always ready for use, except when the supply of current is stopped.—Stromberg Electric Co., Chicago, Illinois.

Tire Paper-Wrapping Machine

The illustration shows a paper-wrapping machine of which the following mechanical points are of interest. The machine will wrap a tire in about seven seconds, giving capacity to handle from 1,500 to 2,300 tires per hour shift, in accordance with the overlaps required by the Consolidated Freight-Classification Committee.

Tire-Wrapping Machine

An automatically controlled tension device insures uniform tension, eliminating also breakage of the paper. For various sizes of tires, adjustments are made by raising or lowering a handle. An open-gap shuttle relieves the operator from opening and closing a gate, while a dash-pot on the upright column prevents drawing the tire into the machine against a heavy overhead roll. This is a convenient feature.

All the high-speed parts run on ball bearings. The machine is a complete unit in itself and requires only electric wiring to put it in operation.—Angier Corporation, Framingham, Massachusetts.

Combined Vulcanizing Pliers

The illustration shows combination steel pliers for tire repair work, designed by an experienced vulcanizer. The tool is a fourfold combination: (1) heavily corrugated jaws which will hold any kind of fabric or cord; (2) steel cutting jaws; (3) a heavy forged steel hook set at the proper angle to prevent hooking more than one layer of fabric at a time; (4) a knife which cuts from any position and only through a single layer of fabric except under extreme pressure.

The knife is made from the best grade of steel for the purpose, may be sharpened with an ordinary three-cornered file, and is

K-B Combination Vulc Pliers

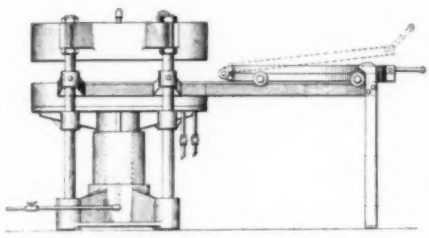
easily removed and replaced with a new blade when necessary.—K. B. Tool Co., Alliance, Nebraska.

MACHINERY PATENTS

Machine for Molding and Vulcanizing Inner Tubes

The use of a vulcanizing press for curing inner tubes has demonstrated: (1) that the vulcanizing heat softens the rubber stock, and (2) that the pressure exerted on the area of the tubes causes the mold to open or spread at the point and force the material out, thus destroying the tube.

The apparatus shown in the illustration eliminates these defects. It consists of a hydraulic press with two ring-form steam-heated platens and a hinged ring-mold mounted on a track for convenient operation. The apparatus is so piped that the tube in the mold may be inflated at desired pressure with either compressed air or steam. After the tube has been partially vulcanized on the outside by contact with the hot mold, full pressure may than be admitted by the control valve to complete vulcanizing the tube on the inside.—Robert H. Atcheson, Providence, Rhode Island, assignor to Ibex Rubber Corporation, Jersey City, New Jersey. United States patent No. 1,388,138.

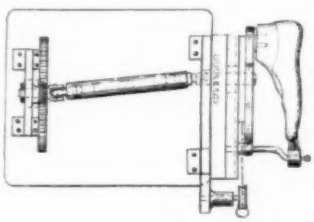


Inner-Tube Vulcanizing Mold

Surface-Coating Machine

A machine for surface coating rubber cement on the edges of tennis uppers is shown in the illustration. The device rotates a last bearing a shoe so that the edge to be cemented is kept in contact with a brush supplying the coating material.

The mechanism is mounted on a pair of standards on a base. On one frame is a set of gears connected by a short telescoping shaft to a carriage slidably mounted on the second standard, and carrying a form plate which controls the motion of the object being coated at the brush.—Stephen W. Bourn, Providence, Rhode Island. United States patent Nos. 1,387,963 and 1,387,964.



Shoe-Cement Applying Machine

OTHER MACHINERY PATENTS

The United States

No.

1,392,330 Machine for cutting tire-casing treads and removing beads. Cassell D. Hibbs, Fort Worth, Tex. (Renewed March 5, 1921.)

1,392,347 Collapsible core for tires. T. Midgley, Hampden, assignor to The Fisk Rubber Co., Chicopee Falls—both in Mass.

1,392,487 Tire mold. J. R. Earp, Chattanooga, Tenn.

1,392,645 Repair vulcanizer. W. E. Johnson, St. Joseph, Mo.

1,393,091 Repair vulcanizer. P. Crosley, Jr., Cincinnati, O.

1,393,164 Tire-cutting machine. W. C. Reinhardt and O. H. Banker, assignors to Racine Tool & Machine Co.—all of Racine, Wis.

1,393,495 Repair vulcanizer. G. H. Bunnell and B. E. Titus, Midway, Utah.

1,394,186 Apparatus for attaching tire-bases to rims. A. Weatherill, assignor to The Goodyear Tire & Rubber Co.—both of Akron, O.

1,394,266 Tire-wrapping or packaging machine. E. H. Angier, Framingham, Mass.

1,394,422 Rubber-punching machine. H. F. Maranville and H. D. Stevens, signor to The Goodyear Tire & Rubber Co.—both of Akron, O.

1,394,547 Tire mold. W. E. Green, Syracuse, N. Y.

1,394,558 Apparatus and process for the manufacture of rubber jars. L. E. Klug, assignor to Rub-Tex Products, Inc.—both of Indianapolis, Ind.

1,395,036 Apparatus for solutioning tire beads. T. A. Burns and D. J. Huether, assignors to Dunlop Tire & Rubber Goods Co., Limited—all of Toronto, Ont.

1,395,055 Tire-building machine. W. B. Harsel, and E. Nall, deceased, by E. A. Nall, executrix, assignors to The Goodyear Tire & Rubber Co.—all of Akron, O. (Original application divided.)

1,395,063 Tire-wrapping and unwrapping machine. W. C. Stevens, Summit County, assignor to Firestone Tire & Rubber Co., Akron—both in Ohio.

1,395,182 Tire-making machine. W. B. Harsel, and E. Nall, deceased—both of Akron; E. A. Nall, Cuyahoga Falls, executrix of E. Nall, assignors to The Goodyear Tire & Rubber Co., Akron—all in Ohio.

1,395,183 Tire-making machine. W. B. Harsel, and E. Nall, deceased—both of Akron; E. A. Nall, Cuyahoga Falls, executrix of E. Nall, assignors to The Goodyear Tire & Rubber Co., Akron—all in Ohio.

The Dominion of Canada

213,580 Apparatus for molding and vulcanizing tires. The Dunlop Rubber Co., Limited, Regent's Park, London, assignee of Colin Macbeth, Birmingham, Warwick—both in England.

213,582 Tire and mold conveyer mechanism. Firestone Tire & Rubber Co., assignee of L. R. McGuire—both of Akron, Ohio, U. S. A.

213,786 Tire-rim finishing machine. The Canadian Consolidated Rubber Co., Limited, Montreal, Que., assignee of G. F. Fisher, Providence, Rhode Island, U. S. A.

213,790 Apparatus for tire manufacture. The Dunlop Rubber Co., Limited, Regent's Park, London, assignee of Colin Macbeth, Birmingham, Warwick—both in England.

213,907 Vulcanizer for tires. A. Adamson, Akron, Ohio, U. S. A.

The United Kingdom

167,267 Bladed wheel for removing surplus rubber from tires. S. M. and P. E. Taber, 504 Mission street, San Francisco, Calif., U. S. A.

167,405 Apparatus for vulcanizing a pile of tires. B. H. Rose, 1106 Forest Road, Lakewood, Ohio, U. S. A.

167,667 Solvent recovery apparatus. R. Haddan, 31 Bedford street, Strand, London; F. Waitz, 78 Obernstrasse, Bremen, Germany.

167,808 Tire-retreading mold. A. B. Leonard, Waukegan, Ill., U. S. A.

167,874 Tire mold. J. Ledwinka, Tioga street, Philadelphia, Pa., U. S. A.

Germany

Patents Issued With Dates of Issue

342,935 (July 20, 1920) Comb-cutting machine. Fa. Fritz Clausner, Nürnberg-Doos.

343,212 (August 21, 1920) Mold for rubber tire. Leonhard Herbert, Schielestrasse 9, Frankfort-on-the-Main.

343,218 (March 4, 1920) Apparatus for making footwear with rubber soles. Guillaume Desclée, Brussels; represented by Justus Havemann, Nürnberg.

344,424 (February 3, 1920) Kettle press for vulcanizing rubber. Wenzel Miersch, Westhafen, Frankfort-on-the-Main.

344,553 (September 10, 1920) Method and apparatus for improving tubes. August Bannasch, Namslau, Schlesien.

344,576 (May 7, 1920) Machine for making wound wire tire reinforcements for pneumatic tire covers. W. & A. Bates Limited, John Healy, Leicester, and Francis Shaw & Co., Limited, Manchester—both in England; R. Giessler, Berlin, S. W. 11.

Design Patents Issued With Dates of Issue

791,259 (November 22, 1920) Vulcanizing case. Gustav Schäfer, Naugarderstrasse 12, Berlin.

791,954 (February 11, 1921) Stretching apparatus for rubber treads.

792,171 (August 29, 1921) Vulcanizing apparatus. Walter Bornschein, Dortmunderstrasse 15, Berlin.

792,373 (August 30, 1921) Roll apparatus for rubber protectors. Fleming & Cie., G. m. b. H., Charlottenburg.

792,672 (August 16, 1921) Vulcanizing apparatus. Wilhelm Mandel, Wollankstrasse 16, Berlin-Pankow.

792,769 (July 2, 1921) Automatic repair apparatus for rubber tubes and covers. Gustav Ude and Emil Goetz, Flüggestrasse 5, Hanover.

792,816 (September 1, 1921) Vulcanizing apparatus. Pet. Müller, Rüttenscheiderstrasse 132, Essen.

793,574 (July 2, 1921) Tin capsule with rubber and combustible material for repair apparatus for rubber tubes and covers. Gustav Ude and Emil Goetz, Flüggestrasse 5, Hanover.

793,612 (September 12, 1921) Hose coupling. Hermann Lucke, Artusstrasse 7, Düsseldorf-Rath.

793,905 (August 17, 1921) Tread fastening. Fr. Behnke & Co., Berlin.

794,016 (September 14, 1921) Vulcanizing apparatus. Franz Boas, Wernerstrasse 36, Dresden.

PROCESS PATENTS

The United States

No.

1,392,576 Manufacture of solid tires. D. E. Goodenberger, assignor to Firestone Tire & Rubber Co.—both of Akron, O.

1,392,608 Manufacture of fabric tires on a core. J. C. Tuttle, assignor to Firestone Tire & Rubber Co.—both of Akron, O.

1,393,644 Manufacture of pneumatic-tire shoes. F. W. Russell, Akron, O.

1,393,998 Manufacture of tires on an inner core. W. H. Fulton, Irvington, N. J.

1,394,069 Construction of pneumatic tires. F. S. Dickinson, New York, N. Y., and J. Springer, Bradley Beach, N. J., assignors to said Dickinson. Application renewed March 18, 1921.

1,394,928 Treatment of tire casings. T. Midgley, Hampden, and R. B. Naylor, Springfield, assignors to The Fisk Rubber Co., Chicopee Falls—all in Mass.

New Zealand

45,776 Application of air-valve on inner tubes, etc. W. K. Hughes, 22 Collins street, and S. G. Pirani, 331 Collins street—both in Melbourne; assignees of E. W. Thurlow, 26 New street, Brighton—both in Victoria.

New Trade Publications

THE MOST ARDENT UPHOLDERS TODAY OF DISARMAMENT COULD find no fault with, and need have no fear of the weapon pictured in one of the recent circulars of The General Tire & Rubber Co., Akron, Ohio. The siege-gun represented has its barrel made of connected rubber tires, while two giant tires form the wheels. The salesman of today, according to the General company, needs to aim with the right gun and ammunition to succeed; and the organization plans to make 1922 a record-breaking year.

THE NOVEMBER ISSUE OF "THE WEATHER VEIN," A PUBLICATION issued by the Carrier Engineering Corporation, 750 Frelinghuysen avenue, Newark, New Jersey, furnishes some interesting information in regard to piping and piping specifications under the heading "Arteries of Civilization." This clever little bulletin is published monthly.

THE PROGRESSIVE SHOE MACHINERY CO., 3116-36 SNELLING avenue, Minneapolis, Minnesota, which has been supplying for thirteen years certain tools and machinery for the shoe trade, has recently entered upon another line of manufacture—tire repair shop equipment. The company's illustrated catalog which appears to be very complete, includes electric vulcanizers, a buffer-bench combination, and other smaller tools, while still other machines are in process of construction.

AN ATTRACTIVE ILLUSTRATED CATALOG, DESCRIPTIVE OF HIGH humidity dry kilns, and relevant to many industries, has been recently issued by the B. F. Sturtevant Co., Hyde Park, Boston, Massachusetts. This organization, established in 1864, aims to furnish "climate à la carte," and has issued many bulletins and handbooks with reference to the company's particular apparatus and air-conditioning service. The catalog under consideration is in two parts, the first devoted to a discussion of the special features of the Sturtevant high humidity dry kilns, while the second division is composed of important data in regard to lumber and hardwoods, quoted from some of the publications of the United States Forest Products Laboratory, Madison, Wisconsin.

THE PUBLICATION OF *The Tire Surgeon*, A BULLETIN ISSUED monthly by the Haywood Tire & Equipment Co., 526-532 N. Capitol avenue, Indianapolis, Indiana, ceased with the October number. It is a matter of regret that this excellent little publication can be no longer continued.

THERE IS MUCH OF INTEREST IN THE OFFICIAL HANDBOOK AND illustrated catalog descriptive of the Fifth International Exhibition of Rubber, Other Tropical Products and Allied Industries, which was held in the Royal Agricultural Hall, London, England, June 3 to 17, 1921. The information contained in this catalog, which was edited by Edith A. Browne, F. R. G. S., is arranged not only under such headings as rubber, cotton, cocoa, coffee, etc., but also under the names of geographical divisions which are in turn subdivided. About a hundred pages are devoted to descriptions of the exhibits displayed, in which a number of nations, with their states and territories, are represented.

PHOTOGRAPHS WHICH SHOW THE DEVELOPMENT OF THE SCHACHT Rubber Manufacturing Co., Huntington, Indiana, from its beginnings in 1909 to the well-equipped plant today are special features of this company's new catalog. Also included is a full list of mechanical rubber goods from truck tires, sheet packing, and tubing to fruit-jar rings. Officers of the company are: W. J. Schacht, president; E. M. Schacht, vice-president; and W. F. Schacht, secretary and manager.

IN ORDER TO PREVENT THE REBUILDING AND RESELLING OF USED tires by "Gyp" dealers it is necessary that such tires should have the axe applied, and be thoroughly mutilated. Motorists can aid the manufacturer and dealer in this good work.—National Tire Dealers' Association.

The Editor's Book Table

"TRAINING INDUSTRIAL WORKERS." BY ROY WILLMARTH Kelly, with Introduction by John M. Brewer, Ph.D. The Ronald Press Co., New York, 1920. Cloth, 8¼ by 5½ inches, 437 pages.

Quoting from the introduction by Dr. Brewer, "Dr. Kelly's book is written to tell industrial managers and educational directors about the lessons which both school people and manufacturers have learned in shop and factory education, and to show how these lessons can be applied to particular establishments."

Dr. Kelly has treated a large and vital subject in a masterful way, supplementing his demonstration of principles with a series of appendices in which are given educational surveys and programs of plant training schools conducted by leading industrial companies. A full classified bibliography is included in the appendix.

"THE NETHERLAND GOVERNMENT RUBBER INSTITUTE AND Its Sphere of Activity." By Dr. A. Van Rossem, Director of the Institute.

This pamphlet of 16 pages recounts in outline the origin of the Institute and its organization and equipment.

Its work includes routine testing, research work and publication of the information collected. Excellent views are given of the exterior and interior of the quarters occupied by the Institute, which are well-equipped with laboratory facilities, and experimental rubber working, vulcanizing, and physical testing machines.

"A METHOD OF MEASURING THE TEMPERATURE AT DIFFERent Points in the Body of an Automobile Tire." By A. O. Ashman, physicist, Research Department, The New Jersey Zinc Co., 160 Front street, New York, N. Y. Paper, 14 pages, illustrated.

This pamphlet details the method of measuring the internal heat of the rubber of any automobile tire by simple and scientific apparatus in which an inexpensive thermo-couple is conveniently inserted into the tire by means of a special awl used as a probe.

"AN ANALYSIS OF THE STATISTICAL POSITION OF RUBBER." By Major J. C. G. Kunhardt (Indian Medical Service). W. H. Rickinson & Son, 3 and 4 Great Winchester street, London, E. C. 2, England. Paper, 44 pages, 8½ by 5½ inches.

The author of this pamphlet, in analyzing the present statistical position of rubber, aims to formulate a more systematic method of examining statistics relating to the rubber industry. He draws attention at the outset to the somewhat crude and inadequate data which are furnished by the various producing and consuming countries, and urges the improvement and standardization of such information. Various common sources of confusion or error which may be met with in interpreting these statistics are mentioned. According to the author, the present surplus of raw material is due chiefly to a temporarily diminished factory output, which condition will rectify itself automatically.

"DE RUBBERCULTUUR TER OOSTKUST VAN SUMATRA (RUBBER Cultivation on the East Coast of Sumatra)." Compiled by J. H. Croockewit, Badhotel, Laag Soeren, Holland. Paper, illustrated, 25 pages, 12 by 15 inches.

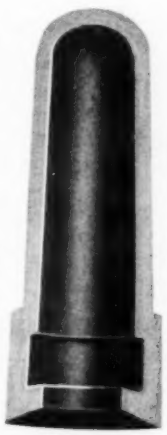
A comprehensive survey of the rubber industry on the East Coast of Sumatra by means of a compilation of 87 photographs, with brief descriptions, has been published in order to show each stage involved in the process of rubber cultivation.

A CASE OF FRAUD BY A CLEVELAND, OHIO, RETAIL TIRE DEALER has been recently disclosed. Having purchased a job lot of seconds from a reputable manufacturer this dealer proceeded to fill in the serial numbers, which had been properly removed by the manufacturer, with the initials of his own firm, and the street number of his place of business. Several of these casings were sold at a good price to unsuspecting buyers before the fraud was discovered. Members of the Cleveland Association will deal with the case as it deserves.—National Tire Dealers' Association.

New Goods and Specialties

Rubber Dust Cap for Convenience

THE advantages of a dust cap for tire valves that can be pulled off quickly and as easily replaced instead of screwed, especially in cold weather, will appeal to everybody. The Dayton rubber dust cap claims this welcome feature. It will not come off the valve unless pulled off and it will keep out every bit of dirt when in position. In addition, a rubber cap cannot rust and thus can be easily removed at any time, in any weather.—The Dayton Rubber Manufacturing Co., Dayton, Ohio.



Dayton Dust Cap

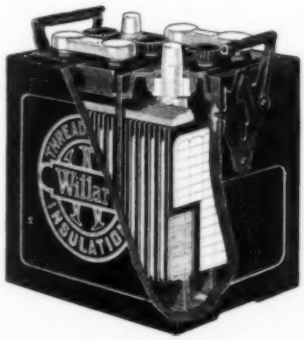
Magazine Pencil with Hard Rubber Barrel

Among the various kinds of pens and pencils clamoring for public attention at the moment, a place is demanded for the new "'Salrite," with its good-looking black hard rubber barrel, metal eraser cap on tip and metal pocket clip. Its magazine holds six extra quality long leads, in addition to the one in the writing head, and when 500,000 words have been written with these, the owner can purchase for a quarter a further supply of leads which will write 1,000,000 words! Features of this new pencil, in addition to its pleasing lightness, are the non-slip finger grip, removable magazine head, choke tip, and self-sharpening point.—Pencil Products Corporation, Flatiron Building, New York, N. Y.

"'Salrite" Scientific Fountain Pencil

Elastic Webbing Boxed

A manufacturer of elastic webbing has hit upon a welcome plan for putting up ¼ and ⅜-inch elastic. It is packed in 2-yard lengths in small boxes which are packed in larger display cartons holding 120 boxes of white and 24 boxes of black, to retail at a popular price. This assists the dealer in keeping his stock in order as well as in display, and also saves the time of the sales clerk in measuring and wrapping, as well as being a convenient unit for the purchaser.—The Derby Textile Co., Derby, Connecticut.



"Monobloc" Battery

All-Rubber Battery Jar

In perfecting an all-rubber storage battery, into which no wood has entered in construction, the manufacturing company has made another use of rubber with which they have been experimenting for several years. Six years ago their system of threaded rubber insulation between the plates was being considered, while with the present addition of the "Monobloc" (one-piece) rubber container every part of the battery is now of rubber except the battery plates themselves and the metal plates embedded in the end walls to support the handles. Soft rubber gaskets surround the posts and make an acid-proof seal, besides acting as shock-absorbers for the plates which rest on the ribs at the bottom of the jar.

Among the advantages of this new hard rubber container is the elimination of separate jars, heretofore required for every battery cell, while, through the use of rubber instead of wood, decay and corrosion are resisted, and electrical leakage is markedly reduced. In the preparation of the "Monobloc" container, the entire piece is pressed into shape at one time under pressure of several tons to the square inch, to produce a jointless container, strong where some others are weak. Every inch of the surface is tested to withstand 18,000 volts, before being passed for assembly.—Willard Storage Battery Co., 246-286 East 131st street, Cleveland, Ohio.

Integral Cells

Hockey Stick That Will Not Sting

The hockey player who has transferred his attention from the game on the ice to that on land will welcome this field hockey stick that minimizes the stinging effect on the hands. It is made with a head of fine English ash, bulger style, while two rubber strips are inserted full length of the built-up cane handle, thus giving extra strength and resiliency while it absorbs the shock of impact with the ball. The illustration shows the cross-section of this construction. The handle is inserted in the head and whipped with waxed twine. This stick comes in weights from 10 to 23 ounces and is known as the "Applebee."—A. G. Spalding & Bros., 124 Nassau street, New York, N. Y.

Super Cord Tire from New Jersey

A new make of tire, known as the "Hudson Super Cord," 6 ply, 30 by 3½, is guaranteed for 10,000 miles. This new type, claimed to be made of the best material, is built oversize with more layers of cord than usual, which means a tire of greater strength. The Hudson fabric tires, 5 ply, 30 by 3½, are guaranteed for 6,000 miles, while Hudson double tubes are hand-made, and said to give service for a year. The latter are specially designed for oversize cord tires.—Hudson Tire Co., 36 William street, Newark, New Jersey.

"Hudson Super Cord" Tire

Sealing Wardrobes with Tubing

A new air-tight dust and moth-proof wardrobe employs rubber tubing for a cushion around the door, a patented feature, forming a perfect seal. These wardrobes are made of fine woods, trimmed with brass, and may have a mirror on the outside of the door if desired. They can be either separate or built into the house and not only protect against moths and dust but provide full length hanging space and save dry cleaners' and storage bills.—The Likly & Rockett Trunk Co., 1365 Euclid avenue, Cleveland, Ohio.

Safety Swimming Tube for All Seasons

Of manufacturing swimming tubes there is no end in these modern days when the ease and conveniences of travel provide bathing beaches the year around. Besides, these swimming tubes can also be used in the indoor swimming pool by those who have not yet acacquired sufficient confidence in their ability to strike out unassisted.

"Safety Water Float"

The "Safety Water Float," illustrated here, is much like an inner tube, provided with a similar valve for inflation, and comes neatly packed in a convenient case that closes with snap fasteners. Shops that handle bathing goods at the winter beaches should find the "Safety Water Float" a popular item on their counters.—United & Globe Rubber Co., Trenton, New Jersey.

Heel with Vacuum-Cup Disks

The "Armortred" rubber heel, made especially for men's shoes, is claimed by the manufacturer to be having a ready sale. The especial feature is a row of cup-like disks encircling the heel, the principle followed being apparently somewhat like that made use of in vacuum-cup cord tires. In both cases a firm "ground-grip" is undoubtedly obtained. The producers of these heels specialize in mechanical rubber goods, tires, heels and soles, and jar rings.—Quabaug Rubber Co., North Brookfield, Massachusetts.

"Armortred" Heel

Quality Tire from the Mid-West

The six fundamental features of a pneumatic tire are: The bead, carcass, breaker strip, cushion, sidewall, and tread. To overemphasize any one of them may provide a talking point for salesmen but it tends to weaken the tire to the extent of overbalancing some point.

"Brunswick" Tire

In the "Brunswick" tire, the manufacturer claims, all of these features have been given equal attention and consideration with the purpose of producing a strong, serviceable product; the tire is perfectly balanced and gives a maximum of service in return for the price paid, yet requires only a small amount of attention.—The Brunswick-Balke-Collender Co., 623 South Wabash avenue, Chicago, Illinois.

The "Vacu-Grip" Inner Tire

"Vacu-Grip" inner tires are made endless, of numerous plies of regular tire fabric with a tread of vulcanized rubber. They are shaped and cured on tire cores and can be used in several different tires if not exposed to the surface of the ground.—A. J. Stephens Rubber Co., Inc., Kansas City, Missouri.

New Cord Tire Has Cross-Bar Type Tread

A departure from the usual type of pneumatic tire tread is shown in the Swinehart "T. N. T." cord tire illustrated here. The cross-bar tread has been selected in preference to the circumferential groove, and it is claimed that the many angles of the foremost of these cross-bars act as a squeegee does in wiping window panes, while the following ones grip the dry spot and hold, preventing skidding. The semi-flat tread causes a compression of the rubber, making it less susceptible to abrasion.

Swinehart "T. N. T." Cord

The carcass of this tire is vulcanized by the expanding air-bag method and particular attention is given to the heavy cushioning of the cords in order to balance the tire.—The Swinehart Tire & Rubber Co., Akron, Ohio.

New Type of Cushion Heel

A new type of rubber heel, whose particular feature is a pair of small knobs at the back and base of the heel to insure safety and comfort in walking, has been recently offered to the trade. These knobs are molded as an integral part of the heel and above them are two hollows which act as air spaces to produce resiliency. The knobs, with their "give and take" are said also to furnish double wear, the heels being made of the best quality rubber. These new articles come in all sizes for men's and women's shoes.—Fellsway Rubber Co., 232 Purchase street, Boston, Massachusetts.

"Travelite Twin-Grip" Rubber Heels

Sponge Rubber Dolls in Germany

The popularity of sponge rubber as a material from which to make dolls has reached even Germany and the *Gummi-Zeitung* advertises one of these as "The biggest hit always." It is constructed with the body and the arms cut from the sponge rubber, combined with celluloid head and limbs. It is interesting to note that these "Saxony dolls" are cleverly made little products patterned after models of noted artists, and imitations will be prosecuted.—Gummiwarenfabrik Curt Schellbach, Seiferitz-Meerane, Saxony.

"Saxony Doll"

"Polita Steel Polish"

A new composition to remove rust from metal surfaces is "Polita Steel Polish," made of rubber and rust-removing ingredients and used just as an eraser would be. It cleans hardware, cutlery, implements, golf clubs, kitchen utensils, instruments, and other articles likely to be attacked by rust.—Eberhard Faber, 37 Greenpoint avenue, Brooklyn, New York.

A Belt for the Baseball Player and Others

Among sporting goods, an article which should appeal to athletes generally is the "Kno-Bind Belt," now being distributed through Dayco Products Co., Salem, Massachusetts. These belts come in two designs, one a semi-dress type, featured for golf and tennis, while the other style is one prepared for sports which are more strenuous, such as baseball. The distinguishing characteristic of this new product is the special elastic webbing over the hips, while the front and back are made of leather. It is claimed that these belts are more healthful and also more comfortable than the ordinary type.—F. & E. Belt Co., Marblehead, Massachusetts.

The "Kno-Bind Belt"

English Sports Shoe

The McAfee golf shoe illustrated here is made with a specially constructed sole and heel. A rubber sole and heel lift with integrally formed rubber studs are inserted between the bottom of the shoe and the outer sole and the top part and bottom lift of the heel, which are perforated to accommodate the rubber studs. This permits the shoe to be worn in the clubhouse without marking hardwood floors and also provides an excellent grip on the golf course. The McAfee golf shoe is made entirely by hand and extra studs can be obtained when needed. The manufacturer sells these shoes at wholesale only.—Alan McAfee, Limited, 38 Dover street, Picadilly, London, England; sold in the United States by Alexander & Oviatt, Inc., 605 South Hill street, Los Angeles, California.

McAfee Golf Shoe

All-Rubber Hose Supporters for Children

Perhaps the newest stocking supporter for boys and girls is made entirely of rubber, except the bone button for adjusting the length, and the celluloid-like slotted shield that fastens the stocking over the usual rubber button. The entire supporter is thus washable and sanitary, and it is claimed that it is also comfortable and durable.

The "Durlastic" hose supporter is cut from red, gray, or black rubber, similar to that used for inner tubes, and has the lower part divided into two strips, like the supporters made of webbing. The ends of these strips fasten through slits in stockinette-backed rubber button blanks like those used on other hose supporters, accomplished by forcing a bone button through small perforations. A series of these holes about an inch apart, permits adjustment. The top of the supporter is also perforated and slit to allow it to go over a button on the underwaist.

"Durlastic" Hose Supporter

The manufacturer of this practical novelty for the notion goods trade makes also a similar garter in red, black, and gray rubber, for women, and body belts for men and women.—Durlastic Manufacturing Co., 29 Greene street, New York, N. Y.

Employing Neon to Detect Spark Plug Trouble

Neon, a rare gas of the air, offers only 1/75 the resistance of air to the passage of an electric spark and emits an orange-red light when electrified. These properties have been utilized in the "Airco" ignition gage, a small vest-pocket instrument which enables any motorist to detect instantly faulty spark plugs and to locate short circuits and leaks of current in the wiring, thus locating defective insulation at any point.

"Airco" Ignition Gage

The gage consists of a hard rubber shell with an indicator in the side, into which is packed a sensitized tube of neon, and covered with a metal cap. When this cap is brought in contact with high-tension electric current, the neon becomes luminous and emits flashes of orange-red light which can be seen through the indicator. —Air Reduction Co., 342 Madison avenue; selling agent, Edward A. Cassidy Co., Inc., 25 West 43d street; New York, N. Y.

Pencil Type Gage for Tires

The Twitchell gage was the first pencil type gage on the market and it is built on a principle never before applied to air gages. The particular feature is the locking device of the indicator bar, which makes absolutely impossible the slipping of the bar and inaccuracy of reading as a result. The ratchet teeth hold the indicator bar set at the pressure of air in the tire. The figures on the bar are white on a black background, to facilitate reading. This gage can be held at an angle to the tire valve in such a manner as to avoid striking the hub, even in wheels of small diameter.—The Twitchell Gauge Co., 1516 Wabash avenue, Chicago, Illinois.

Twitchell Gage

Cord Tire with Non-Skid Burr

An unusual type of cord tire, which is claimed to be non-skidding, has as its special feature a wire mesh incorporated in its tread which makes it hold the road surface, even on icy pavements or steep hills. The wire burrs used in these tires will not work loose, it is said, or come out, while they wear down in the same proportion as the rubber in the tread, the ends of the wires being presented to the road surface.

"Burr-Lockt" Cord Tire

Although these "Burr-Lockt" tires are not guaranteed to give any definite miles of service, testimonials from users state that such tires are still in good condition after approximately 6,000 or 7,000 miles of service. One motorist is still using one of them after it had already run over 9,300 miles of road in a journey to California. "Burr-Lockt" tires are made of the best materials, and come in eleven sizes.—Burlock Non-Skid Tire Corporation, 828 Seventh avenue, New York, N. Y.

INTERESTING LETTERS FROM OUR READERS

What Is Gold-Beaters' Skin?

TO THE EDITOR:

DEAR SIR: In a very interesting article in the October number of THE INDIA RUBBER WORLD describing the construction of the rigid airship, mention is made of the use of gold-beaters' skin as a lining for the eleven to nineteen gas bags within the hull, cemented with rubber to single-ply cloth in American and British practice. Kindly inform me what is gold-beaters' skin.

INQUIRER.

Gold-beaters' skin is the thin, light, toughened, and comparatively costly outer membrane of the cæcum, or blind gut, of the ox, somewhat similar to the human vermiform appendix. After separation, cleaning, and drying, it is finished by treating with camphor or alum and coated with egg albumen. Thin plates of gold are placed between layers of such skin and hammered into the filmy sheets known as gold leaf. Although the skins, imported chiefly from England and Germany, are usually 3½ inches square, the material is available for balloon use up to 6 by 30 inches.—THE EDITOR.

Ramie for Cotton in Tires

TO THE EDITOR:

DEAR SIR: Careful study of the fibrous materials available for the manufacture of automobile tires and other rubber goods has convinced me that we are on the eve of an important development in the making of cord, and perhaps fabric tire casings, resulting in cord tires that will give 50,000 miles' service when retreaded a couple of times. The rubber perhaps will not be different from that used in high-grade tires today, but the fiber will be, not only different, but decidedly better than cotton. The fiber will be ramie, which has eight times the tensile strength of cotton, is of enormously greater length of staple, and is free from liability to damage by mildew.

The possibility of securing an abundant supply of ramie fiber is based on two recent inventions. First, that of William A. Shely, of Chicago, who has produced a hemp breaker which will not only separate fiber from green or dried hemp but will as readily decorticate flax or ramie stalks. Second, a process due to David E. De Lape, of Los Angeles, whereby the fiber separated from the stalks is retted in a solution, the formula of which has been patented. The chemical solution decorticates the fiber in a few minutes, whereas, the former method of natural retting required several months.

Made available by these rapid methods of production ramie will become useful in many other rubber goods besides tires and greatly add to their durability.

Does THE INDIA RUBBER WORLD regard my confidence in ramie for tire construction as justified?

MARTIN L. DRIVER.

It is certainly a strong point in favor of ramie that its fiber is very long, 4 to 6 feet or more, and that it has remarkable strength and durability, a textile experiment in the laboratory of Frémy showing a breaking strain for ramie as high as 40 grams, while isolated fibers of hemp showed only 5 grams. Ramie ordinarily is considered three times as strong as hemp and eight times as strong as cotton. Ramie of all vegetable fibers, is also conceded to be the least affected by moisture. So, too, the fibers may be separated to almost the fineness of silk, they are quite as white as bleached cotton, and more lustrous than linen; but ramie is no more elastic than cotton, and, compared with cotton, is lacking in one very important property, namely, torsion, as is shown in the following table of physical factors of ramie and four other fibers used in spinnings.

	Ramie	Hemp	Flax	Silk	Cotton
Tension	100	36	25	13	12
Elasticity	100	75	66	400	100
Torsion	100	95	80	600	400

The use of ramie must necessarily be limited by the low flexibility of the fiber. It cannot rival cotton in softness; and, owing to the smooth, regular surface of the filaments, as shown under the microscope, ramie cannot, like cotton, be spun into fine counts, as the filaments lack cohesion and will not cling well to one another.

The strength of yarn does not depend chiefly on the length and toughness of a fiber in itself, since the strain usually falls on a stretch of yarn much longer than even the longest of fibers. Yarn weakness is due rather to a slipping of the filaments upon one another than to mere lack of fiber strength. A spinner easily overcomes this slipping tendency in twisting filaments together in working with cotton or other fibers of high torsion index, but in working with ramie he is plainly handicapped in trying to overcome its inherent fault. Until some means is devised to correct this trouble and offset this natural shortcoming it appears vain to hope for the practical use of ramie in either tire fabric or cord construction.—THE EDITOR.

CHARLES B. SEGER APPROVES SHOP COUNCILS

In an address delivered before the Academy of Political Science at the Hotel Astor, New York, N. Y., on November 4, entitled, "Employe Representation and Personnel Work in a Large-Scale Organization with Many Plants," Charles B. Seger, chairman of the United States Rubber Co., asserted that establishing mutual confidence is the first requisite to proper industrial relations, and in this employers must take the lead.

"Individuals must know each other before mutual confidence can be established," he said, "and this is equally true between groups of employes and their employer. There must be intimate and frequent intercourse between employer and employe. By the very nature of things this intercourse cannot be personal or individual.

"The point of contact must be through some representative body, and I believe that the nearest approach to individual relationship can be attained through shop councils consisting of elected representatives of the employes and the local management representing the employer.

Stating that each plant in a large organization must be considered as a separate family in respect to human relationships, he continued: "The problems which arise between management and employes can never be settled on a national or an international basis. Neither can they be settled by legislative action. They must be dealt with at the local plant at which they arise. There may be a general supervision from the employer's point of view, and there may be association of the industrial families, but the real problems are local and local cures must be applied.

"If American business is to keep its place in the world's markets, employe and employer must realize quickly how closely their interests are bound together. Building up mutual confidence rather than factions and classes is our problem."

MISALINEMENT OF WHEELS

Misalinement of wheels, seemingly a matter of small importance, usually results in tires wearing out prematurely, while it is also one of the causes of skidding. For example, a 30 by 3½ fabric tire which is 94 inches in circumference will drag 92 feet in running one mile, if it is out of line only one degree. In inches, 1/16-inch misalinement skids the tire 13 feet per mile; and 1/2-inch, 115 feet per mile. Tires of different sizes wear down in relatively the same ratio per degree of misalinement. Recent experiments show that the wheels of a car, to give the most perfect service, should be toed in from 3/16 to 3/8 of an inch and that they should be slightly farther apart at the top than at the bottom. Toeing in helps to keep the car in the road, and is of particular value when an obstruction is encountered—*Miller News Service.*

The Obituary Record

Advertising Manager of The India Rubber World

EDWARD FRANCIS PFAFF, secretary and advertising manager of THE INDIA RUBBER WORLD, died suddenly on November 11 at his home in Brooklyn, New York, aged 53 years. His untimely passing was a great shock to relatives, friends and business associates, as he had been active until the day of his death.

Edward F. Pfaff

Born in Boston, Massachusetts, July 13, 1868, Mr. Pfaff came of a prominent and wealthy family, his father, William Charles Pfaff, being a member of the Ancient and Honorable Artillery, the oldest military organization in the United States, while Colonel Charles Pfaff, the well-known Boston brewer, is his cousin.

Following his education at the Dwight Grammar and the Bryant & Stratton Commercial schools in Boston, Mr. Pfaff went to Springfield, Missouri, and engaged in the pork packing business. It was during this period of four or five years that he married Miss Bertha Freeman, of that city. Returning to New England, he was for a time in the hotel business.

Thereafter he began his career in the trade paper and advertising field which was to be his life work. At first he was for several years with the *Shoe & Leather Reporter*, Boston, Massachusetts, as an advertising solicitor and news writer, and later became New York representative and correspondent for *Shoe and Leather Facts*, a Philadelphia, Pennsylvania, periodical. His aptitude for advertising then led him into an agency business of his own in New York City, which he sold out seventeen years ago to become advertising manager of THE INDIA RUBBER WORLD.

As such he was an efficient, conscientious worker who always gave freely of his best for the advancement of the paper, and its advertising pages year by year have testified to his eminent success in his chosen field. During his incumbency the average monthly volume nearly trebled.

In 1914 Mr. Pfaff visited the European rubber trade, and as representative of THE INDIA RUBBER WORLD attended the Fourth International Rubber Congress held in London at that time.

A man of marked individuality, a brilliant conversationalist, quick at repartee, and having a quaint humor of his own, few men enjoyed a wider acquaintance or received a warmer welcome in rubber circles everywhere. His breezy visits will long be missed by the trade, and his staff associates will ever remember his unfailing loyalty, optimism, cooperation, and kindly, genial personality.

Mr. Pfaff was a member of the Royal Arcanum and of Forest Park Golf Club. His widow, Mrs. Bertha Pfaff, and one son, Edward Arthur Pfaff, survive him.

Funeral services were conducted in Brooklyn, New York, November 14, when a mass of requiem was celebrated in St. Gregory's Roman Catholic Church. The interment occurred the following day in Forest Hills Cemetery, Boston, Massachusetts.

The Discoverer of Guayule Extraction

William Appleton Lawrence, chemist, inventor, and the man whose efforts more than those of any other one person gave guayule to the rubber industry, died at his home in Jamaica, Long Island, New York, on November 10, 1921, aged 87 years.

Born in Pepperell, Massachusetts, October 26, 1834, Mr. Lawrence received his early education at Pepperell Academy, Lawrence Academy at Groton, Massachusetts, and was graduated from Amherst College in 1861 and from Union Theological Seminary in 1866. He was also a pupil of Dr. Charles A. Seeley, chemist. Appointed superintendent of the Brooklyn Children's Aid Society in 1866, he continued in that capacity until 1873, when he went into business as a manufacturing chemist under the name of William A. Lawrence & Co., New York, N. Y.

William A. Lawrence

From 1876 to 1901 he was a member of the firm of Whiting & Lawrence, manufacturing chemists, Waterville, New York, then the largest consumer of gasoline in the country. Hops were extracted, using gasoline as a solvent. In this connection Mr. Lawrence invented and patented a process for refining gasoline into rhigoline and became recognized as an expert in petroleum naphthas.

In 1901, Edward B. Aldrich, Thomas F. Ryan and Nelson W. Aldrich enlisted his aid in developing their proposition to extract rubber from the guayule shrub of northern Mexico, it being believed that it was a gasoline, or in any event a chemical, problem. But Mr. Lawrence soon discovered that the solution was merely a process of rubbing and pressure in the presence of water in a pebble mill. This process was patented and assigned to the Continental Rubber Co., organized in 1903 to use the process, which also became the basis of the Continental-Mexican Rubber Co. and the Intercontinental Rubber Co. Mr. Lawrence then retired from his hop extract business to become vice-president and consulting chemist of these companies and actively engaged in the extraction of guayule. A plant with a capacity of over a million pounds of rubber a month was erected at Torreon, Mexico, in 1905, and guayule soon became a rubber of growing interest and importance.

For making guayule extraction commercially practicable Mr. Lawrence patented a dozen or more machines and processes, both for extraction and deresination. And while many other machines and processes were patented here and abroad by others, none equalled the Lawrence process in simplicity and efficiency.

Although Mr. Lawrence retired in 1917, at the age of 82, he retained his interest in rubber. He was a member of the American Chemical Society, American Association for the Advancement of Science, Society of Chemical Industry, and a life member of the American Red Cross.

Mr. Lawrence was a fine example of a Christian gentleman whose word was inviolable. His sterling character, magnetic personality, and intense devotion to duty drew to him hosts of friends and endeared him to all his associates, particularly the officers and employes of the Intercontinental Rubber Company and its subsidiaries. Mr. Lawrence had faith in young men and his influence was instrumental in shaping the character and starting a number of them in successful business careers.

The Father of the Pneumatic Tire

The death of John Boyd Dunlop in Dublin, Ireland, on October 23, at the advanced age of 81 years, was briefly noted in the November issue of THE INDIA RUBBER WORLD. Born in Ayrshire, Scotland, February 5, 1840, he became a veterinary surgeon in Belfast, Ireland. He was commonly and very properly regarded as the inventor of the pneumatic tire, although in strict accordance with the facts he shared that honor with another.

John Boyd Dunlop

Although the distinction of being the first patentee of a pneumatic tire went in 1845 to an Englishman named Robert William Thomson, his so-called "aerial wheels" were little used and soon forgotten and it remained for Mr. Dunlop, forty-three years later and without any knowledge of the Thomson invention, to bring out in 1888 the type of elastic tire which was to have the first great and far-reaching effect upon the evolution of the bicycle—the pneumatic tire. While the pneumatic tire of today combines the ideas of a host of other inventors, and is far removed from the tire developed by Mr. Dunlop thirty-three years ago, yet its chief essentials were embodied in his first patent specification, and all the improvements in detail that have since been wrought in the trade have not resulted in giving such universal prominence to any other one inventor in this field.

Just as Thomson was ahead of his time and his tire found no favor, Mr. Dunlop's invention might also have been neglected for many years but for the foresight and efforts of the late Harvey du Cros, a prominent enthusiast in Irish bicycle racing, who organized the Dunlop companies and labored unceasingly to make the Dunlop tire practicable. Otherwise the whole progress of modern locomotion from automobiling to aviation would have been checked, for the direct influence of the pneumatic tire is easily traced in all the astonishing developments of the past thirty-three years in these fields.

The first "Dunlop" tire, it appears, was a rubber tube, with means of inflation, bound upon each of the wheels of a tricycle owned by a young son of the inventor, and held to the rim by wrappings of tape. At first this "pudding tyre," as it was called, was generally ridiculed, but it was faster and more resilient than the solid tires of that day, and soon the patents granted for it not only formed the foundation of one of the world's most important tire companies, but the pneumatic tire was admitted to be an important item of automobile equipment.

After having undergone various changes this concern became, in 1895, the Dunlop Pneumatic Tyre Co., Limited, with a capital of £5,000,000 and a trading profit in a single year exceeding $2,000,000. For a while through its patent ownership it largely monopolized the British pneumatic tire field, besides licensing manufacturers in America and making large sales elsewhere. Patents were acquired for the Welsh wire edge fastening, the Brown-Stillman fastening, and the Bartlett "clincher" principle, which materially strengthened the position of the company, it soon having been realized that the Dunlop invention covered nothing not anticipated in Thomson's patent of 1845, which was held on the Continent to have anticipated many other later inventions.

The Dunlop company was soon deep in litigation in the attempt to protect its monopoly, and in 1899, foreseeing the result of the expiration of the Dunlop-Welch patent, organized a subsidiary manufacturing company, known as the Dunlop Rubber Co., Limited, with a plant at Birmingham, England. This firm became a prominent British advertiser and spent thousands of pounds annually in publicity, which usually included the full figure of Mr. Dunlop, or his distinguished looking head with its long gray beard and high silk hat.

This company proved highly successful and is now only one of several corporations embraced by the Dunlop system, which controls rubber estates and cotton mills as well as rubber mills and earns over $2,000,000 in net profits annually. The present Dunlop interests include also tire factories in France, Germany, Canada, Australia, America and Japan, and profit from the sale of Dunlop products in many other countries.

The Dunlop patent monopoly has long ceased to exist, but this pioneer trade name still remains a valuable asset as applied to tires, and has been extended to a large output of miscellaneous rubber goods. While never losing his interest in pneumatic tire development, Mr. Dunlop has not for some time been actively connected with the business, and has lived in Dublin, Ireland, where his venerable old age has been brightened by the undisputed fact that his invention popularized the bicycle and was the vital factor in the development of the automobile.

Superintendent of the Empire Plant

Abdon Lee, superintendent of the Empire Rubber & Tire Corporation, Trenton, New Jersey, died at his home in Trenton recently, after a prolonged illness. Mr. Lee was 69 years old and had been connected with the Empire company for the past fifty-four years.

Starting at the plant when a boy, Mr. Lee worked his way up to the position he held. He was first employed by the old Star Rubber Co., and when that concern failed and the plant was reopened under the name of the Empire Rubber Co., he continued with it. For the past thirty years Mr. Lee had been superintendent of the plant and had been in active charge until two years ago. He was held in high esteem by both officials and employes.

Mr. Lee was a member of the Masonic fraternity and the Knights of the Golden Eagle. He is survived by a widow, one son and three daughters. The interment was in the family plot at Trenton. In respect for Mr. Lee the Empire plant remained closed during his funeral.

"TO ADVANCE AND SAFEGUARD THE BUSINESS INTERESTS OF tire dealers and to promote a cooperative relationship between the manufacturer, the tire dealer and the buying public."—Extract from the constitution of the National Tire Dealers' Association.

THE UNITED KINGDOM RETAINED ONLY 186 TONS OF RUBBER DURING August. This is the lowest amount retained since January, 1920. The average amount retained for the seven months ended July, 1921, was 6,246 tons monthly. This is a very favorable sign—Rickinson.

Activities of The Rubber Association of America

Meetings

THE regular monthly meeting of the Board of Directors was held at the Union League Club, New York City, on November 17. Routine matters occupied the attention of the members present at this meeting.

On November 18 the Accounting Committee met for the purpose of considering several important questions placed before this committee for attention.

At the meeting of November 16 the Executive Committee of the Sundries Division discussed the matter of complying with the Canadian regulations that relate to imports of druggists' sundries.

A meeting of the Executive Committee of the Tire Division will be held December 7, in the Association rooms. This is the postponed November meeting.

Annual Meeting and Banquet

The annual meeting and banquet of The Rubber Association of America will be held on January 9, 1922, at the Waldorf-Astoria, New York City.

To Eliminate Mileage Adjustment Abuses

A movement is well on the way to adoption throughout the tire industry to eliminate the chief evils which have for years caused loss to consumers, dealers and manufacturers through improper claims for adjustment, and manufacturers and dealers are working in harmony to produce the desired result.

Motorists who take good care of their tires are the strongest contributing factor to future economy in tire costs. Adjustments based on claims other than because of manufacturing defects strike at the efforts of the industry to secure tire economy. Dealers have been placed in the embarrassing position of losing the good will of tire users and manufacturers have borne the brunt of the loss due to claims which have arisen out of public misconception of the responsibility of tire manufacturers.

All of the abuses have tended to increase costs, and the whole purpose of the present movement is to eliminate the waste due to these causes.

Under the plan there is a revision of the old guaranty in the form of a new manufacturer's standard warranty, aimed to clear up misunderstandings the public may have had regarding the manufacturer's responsibility. A standard claim form is also being placed in the hands of dealers. The manufacturers are taking steps to put the plan into effect immediately. The new manufacturer's standard warranty and the standard claim form have already been welcomed by the National Tire Dealers' Association as a constructive measure. Through the plan all claims covering alleged defects will be presented in a uniform manner for consideration by the tire manufacturer.

The form should result in the elimination of "policy" adjustments, which have been the bugbear of the tire industry since its inception and have caused losses running into large sums annually. Hereafter manufacturers will consider alleged defective tires only on the basis of general appearance and the condition in which they are returned by the customer. No claims will be considered unless the standard claim form is executed by the tire owner. The claim form does not enter into the transaction between the dealer and the consumer at the time of sale, and is only to be used when the tire owner may have occasion to present a claim based on defective workmanship or material.

The warranty which is to be printed on price lists, tags and stickers accompanying tires, etc., much in the same manner as the former so-called guaranty was used, reads as follows:

Manufacturers' Standard Warranty

(Approved by the Tire Manufacturers' Division of The Rubber Association)

We do not guarantee pneumatic automobile tires for any specific mileage, but every pneumatic automobile tire bearing our name and a serial number is warranted by us to be free from defects in workmanship or material.

Tires claimed to be defective will be received only when all transportation charges are prepaid, and when accompanied by this company's claim form duly filled out and signed by owner. If, upon examination, it is our judgment that the direct cause of the failure of the tire to render satisfactory service is attributable to faulty material or workmanship, we will, at our option, either repair the tire or replace it for a charge which will compensate for the service rendered by the returned tire, based upon its general appearance and condition.

Pneumatic automobile tires in which a substitute for air has been used, tires used when not inflated to the pressure recommended by us, used under loads in excess of those recommended by us, used on wheels out of alignment, abused or misused, used on rims other than those bearing these stamps ( ), ( ), ( ), or which have been injured through accident or design, are not subject to claim hereunder.

This company does not authorize any dealer or agent to make any other or additional "Guaranty" or "Warranty."

THE A. B. C. TIRE COMPANY.

The standard claim form for pneumatic automobile tires may be obtained from the Association. A similar policy will be adopted in respect to cushion and solid tires, and will include a standard warranty and claim form.

Specification Committee Completes Important Work on Railroad Mechanical Goods

At a meeting of the Joint Committee, which is composed of the Specification Committee—Mechanical Goods Division of the Rubber Association and of a Sub-Committee of the American Railway Association, held at the Association offices on October 21, the formulation of proposed standard specifications for steam hose, tender tank hose, axle generator belting and braided and wrapped air hose, was completed. The specifications referred to were formulated on the basis of the "General Instructions on Standard Methods of Test," which has been adopted by the American Railway Association. The Joint Committee is now engaged in preparing proposed standard specifications for cold water hose and cotton rubber-lined fire hose.

Westbound Tire Rates to Coast Reduced

The Traffic Committee of the Association has been in negotiation with the trans-continental carriers with respect to a revision of the rates on pneumatic tires, in carloads, from all eastern shipping points to Pacific Coast ports. After considerable negotiation the carriers have agreed to establish a rate of $2.75 per one hundred pounds from eastern shipping points to Pacific Coast ports, reached by water lines, Los Angeles to Seattle, inclusive, to meet competition through the Panama Canal.

It will be necessary to submit this proposal to the Interstate Commerce Commission for permission to reduce the rates, and at this time the Association cannot state the exact date upon which the new rates will become effective.

The percentage reduction in rates agreed to are as follows:

FROM	PERCENTAGE REDUCTION
Points east of Pittsburgh and Buffalo, including New England	37.7
Buffalo, Pittsburgh and Akron districts	36.5
Detroit and Indianapolis group	34
Chicago territory	32
Mississippi river points	30
Denver territory	7.4

WILLIAM C. COX, TREASURER OF THE ASSOCIATION, HAS RESIGNED, and his successor will be appointed at the December meeting of the Board of Directors.

TIRE PRICES AGAIN REDUCED

Early in November leading rubber tire manufacturers, in rapid succession, began notifying dealers and the public of drastic reductions in consumers' prices on cord, fabric, and truck tires, and inner tubes. These reductions are virtually equal and all became effective November 15, unless otherwise specially noted below. The new lists set the prices at lower levels than those of 1913, which were then regarded as exceptionally low. The present reduction is said to have been made to assist dealers in making their plans for 1922 requirements. In case dealers generally respond, tire factories will be able to produce on an increased winter schedule.

Tube prices also have been correspondingly reduced. In general, the average reductions are 10 per cent on fabrics, 20 per cent on cords, and 10 per cent on truck tires, when the latter were included, and 10 to 20 per cent on inner tubes.

The Firestone Tire & Rubber Co., on November 2, led the other tire companies by naming price reductions of 20 per cent on cords, 10 per cent on fabrics, and 10 per cent on truck tires, and announcing it as a continuation of the price reductions given to dealers the latter part of October.

The United States Tire Co. announced, effective November 10, a reduction in prices of its full line of tires and tubes, including Royal cords and fabric tires for passenger cars, and solid and pneumatic tires for trucks. Cord tire prices are reduced 7½ to 22½ per cent, averaging between 15 and 20 per cent. Fabric tire prices are reduced between 10 and 15 per cent.

Reduction of 10 to 33⅓ per cent from previous price lists of tires and tubes has been announced by The Fisk Rubber Co.

The Madison Tire & Rubber Co., Inc., has reduced prices on its cord and fabric tires and inner tubes, meeting the changes made by tire manufacturers generally.

Tyer Rubber Co. has reduced its prices approximately as follows: cord tires 20 per cent, fabric tires 10 per cent, and inner tubes 20 per cent.

The Hewitt Rubber Co. has made price reductions, from 20 to 30 per cent on cord tires, from 10 to 23 per cent on fabric tires, and 10 per cent on inner tubes.

The Hudson Tire Co., Inc., has met the new price reductions on its Super Cord tire.

Pennsylvania Rubber Co. of America announced a downward revision of its prices, effective November 2, covering Vacuum Cup fabric and cord casings, also "Ton Tested" tubes.

Charles E. Miller, Anderson Rubber Works, has reduced prices applying to his double anchored cord tire and fabric and inner tubes. The reductions run from 18 to 20 per cent below the preceding schedule.

The Voorhees Rubber Manufacturing Co., mechanical rubber goods and inner tubes, has recently made approximately 20 per cent reduction in the price of its tubes.

The B. F. Goodrich Rubber Co.'s price reduction applies on all sizes and types of Goodrich fabric tires, Silvertown cords, and inner tubes, as well as all types of motor truck tires. On cords the reduction is from 23 per cent downward.

The price reductions of the Kelly-Springfield Tire Co. included the full line of tires. The average reductions were on cord tires, 20 per cent; on fabric tires, 10 per cent; on caterpillar truck tires, 15 per cent; on standard truck tires 10 per cent, and on tubes, from 10 to 20 per cent.

The Goodyear Tire & Rubber Co.'s price reductions are equivalent to those of the other large tire producers, averaging 20 per cent on cords, 10 to 20 per cent on fabrics, and 10 per cent on truck tires. Under the new schedule cords can be bought within 25 to 30 per cent as cheaply as fabrics.

The Miller Rubber Co. announced average reductions in tire prices of 20 per cent on cord, 10 to 20 per cent on fabric, and 10 per cent on truck tires.

The Denman-Myers Cord Tire Co. announced an average reduction of 20 per cent from the former list, and effective November 21.

The Dayton Rubber Manufacturing Co. has reduced prices on tires and tubes, taking effect November 15.

A RUBBER MAN'S MENU

A birthday dinner, recently given on board the S. S. "Lafayette," in honor of Fred T. Roberts, secretary and treasurer of Paramount Rubber Consolidated, Inc., 5232 Germantown Avenue, Philadelphia, Pennsylvania, displayed the following menu that was unusual, to say the least.

COMPOUND

HORS-D'ŒUVRE
Scrap Rubber
"ZUP"
Liquid Ammonia

FISH
Filets Smoked Sheets

ENTREE
Blown Œufs

ROAST
Rôti de Bœuf Fine Pará
Tired Mutt-on Rims Poulet Rubber Neck

LEGUMES
Murphys á la Golf
Asparagus Whiting Sauce Vacuum Salad

DESSERT
Fromage H_2S Biscuits Glacé
Café Ceylon Resilient Cake

STRAIGHTSIDE TIRE-BEAD TESTING

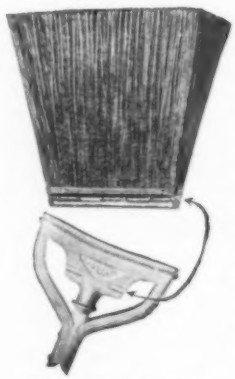
The National Standard Co., Niles, Michigan, maintains an engineering department fully equipped for testing straightside tire beads. The expanding equipment has a capacity for exerting 50,000 pounds pressure, and is so arranged that readings may be taken of the expansion at every 1,000 pounds. The total set which the bead takes is found by stopping the expander a little under the known bursting point of the bead being tested, then releasing the pressure and measuring the total expansion in comparison to the original measurement.

The usual bursting point of a bead depends upon the bead construction, and ranges from four and five thousand to fifteen thousand pounds. In testing, a preliminary expanding pressure of 500 pounds is applied to the bead to take up all slack in its construction. From the zero thus set, readings are made at each advancing 1,000 pounds pressure applied.

Two beads are necessary for a test in order that one bead may be carried up to the bursting point to know at what pressure to stop for the determination of the total set.

This bead-testing service is furnished free to tire manufacturers regardless of what bead material may be used. All tests are confidential and reported only to the manufacturer for whom made.

FACTORY BROOM WITH DETACHABLE HEAD



The Edlund Broom

A new and economical factory broom is shown in the illustration, consisting of a holder and a filler. The holder will outlast many fillers, being made of pressed sheet steel.

The filler, which is inserted in the holder and secured by a clamp and locking ring, is made of bass, bassine, bahia, or their combinations best suited to the kind of sweeping to be done. These fibers are securely held together by a steel ferrule.

With this construction the broom wears down evenly to a short length and will outwear from four to six ordinary corn brooms.—Osborn Manufacturing Co., Cleveland, Ohio.

News of the American Rubber Industry

Financial Notes

Goodyear's Favorable Statement

NET sales of The Goodyear Tire & Rubber Co. for the seven months ended September 30, 1921, were $62,421,179, according to a report recently issued to stockholders. Net earnings, available for interest and fixed charges, were $6,838,486. Interest charges amounted to $2,319,604, while other miscellaneous charges and adjustments mostly losses on liquidation of fixed property and adjustment of inventories in subsidiary companies, aggregated $1,123,028. The net surplus amounted to $3,395,853.

The general balance sheet showed the company's ratio of current assets to current liabilities to be approximately 10 to 1. Its aggregate cash holdings, United States Treasury certificates and bank acceptances, totaled $23,722,485.

Edward G. Wilmer, president of the company, in his statement to the stockholders said: "Sales of automobile tires during the first nine months of 1921 exceed those of the same period of 1920. The volume of mechanical goods including rubber heels, though abnormally low, is now showing gradual improvement. With a seasonal curtailment in the use and demand for tires, production has been gradually curtailed. Immediate prospects indicate that no further reduction of consequence will be necessary, and an increase shortly after the first of the new year is probable. For a period sales have exceeded production with the result that inventories of finished tires are now substantially smaller than those of last year."

The official statement and balance sheet for the seven months ended September 30, 1921, follows:

Statement of The Goodyear Tire & Rubber Co.

Net sales		$62,421,179.43
Net earnings, available for interest and fixed charges		6,838,486.44
Interest charges		2,319,604.00
Miscellaneous charges, mostly liquidation on fixed property		1,123,028.00
Net to surplus		3,395,853.00
ASSETS		
Properties and plant (less depreciation)		$53,166,517
Investment in and advances to subsidiaries—		
Interest in net capital assets	$16,114,761	
Interest in net current assets	14,896,284	
		31,011,045
Current assets—		
Inventories	$30,785,909.28	
Accounts and notes receivable	12,696,881.10	
Treasury certificates and banker's acceptances	8,981,463.42	
Cash	14,741,021.59	67,205,275
Other assets—		
Including special accounts and A. C. & Y., other securities and good will, patents, etc		12,500,000
Deferred charges—		
Including prepaid insurance, discount on bonds and debentures		7,062,109.41
		$170,944,948.52
LIABILITIES		
Capital stock—		
Prior preference (issued and to be issued)	$29,575,700	
Preferred	65,079,600	
Management	10,000	
Common, no par value	1,000,000	
		$95,665,300
Funded debt—		
First mortgage bonds	$30,000,000	
Debentures	27,500,000	57,500,000
Current liabilities—		
Trade accounts, notes payable	$5,229,398	
Accrued interest and premiums on bonds	1,533,337	6,762,736
Reserves (losses on common, etc.)		7,621,058
Surplus		3,395,853
		$170,944,948.00

Note—Contingent liability in respect of endorsement on secured notes, $725,000.

Goodyear Debentures

On November 9, $27,500,000 ten-year 8 per cent sinking fund gold debenture bonds dated May 1, 1921, were offered for public subscription. This debenture issue was sold in May of this year to bankers in connection with the readjustment of the Goodyear company's finances and therefore represent no new financing by the corporation.

Canadian Goodyear Earnings

The Goodyear Tire & Rubber Company of Canada, Limited, reports net profits of $200,129, after all expenses, interest and depreciation, for the three months ended September 30, 1921. The profit and loss surplus on September 30 amounted to $300,889.

The Republic Rubber Corporation

Condensed balance sheets were issued November 4, 1921, by the protective committee for the second preferred and common stock of The Republic Rubber Corporation, showing the condition of the corporation on June 22, 1921, the date the receiver took charge. Operating losses under the receivership to September 30 have been $131,422.01, of which $70,000 has been charged to depreciation and $45,000 to special reserves, leaving an actual loss of $16,422.01 for the three months. This compares with a loss of over a million dollars from January 1 to the time the receiver took charge of the property. This is a very excellent showing when considered in connection with the fact that the organization was considerably demoralized and that it is now working in complete harmony.

Dividends Declared

The Converse Rubber Shoe Co., Malden, Massachusetts, has declared its regular dividend of $3.50 a share, payable December 1, 1921, on preferred stock of record November 15.

The General Electric Co., Schenectady, New York, has declared its regular quarterly dividend of $2 a share, cash, and its semi-annual stock dividend of 2 per cent, both payable January 14, 1922, on stock of record December 8, 1921.

The Hood Rubber Co., Watertown, Massachusetts, has declared its regular quarterly dividend of $1.75, payable December 1 on common stock of record November 21, 1921.

Akron Rubber Stock Quotations

The following are closing quotations of November 14, supplied by the App-Hillman Co., Second National Building, Akron, Ohio:

	Bid	Asked
American R. & T. Co., com	30	40
Amazon Rubber Co., The	10	20
Firestone T. & R. Co., com	54	58
Firestone T. & R. Co., 6% pfd	85	90
Firestone T. & R. Co., 7% pfd	73	75
General T. & R. Co., The, com	200	210
General T. & R. Co., The, 7% pfd	85	95
Goodrich, B. F., Co., The, com	32	33
Goodrich, B. F., Co., The, pfd	78	80
Goodrich, B. F., Co., The, 5-yr. 7% notes	98	99
Goodyear, T. & R., Co., The, com	11	12
Goodyear, T. & R., Co., The, 7% pfd	29	30
Goodyear, T. & R., Co., The, 8% prior pfd	61	63
India T. & R. Co., com	65	75
India T. & R. Co., The, 7% pfd	75	85
Mason T. & R. Co., The, 7% pfd	45	49
Mason T. & R. Co. The, com	6	7
Mason T. & R. Co., The, 7%	45	49
Marathon T. & R. Co., com	3	4
Miller Rubber Co., The, com	51	55
Miller Rubber Co., The, 8% pfd	73	76
Mohawk Rubber Co., The	80	90
Phœnix Rubber Co., com	..	15
Phœnix Rubber Co., pfd	..	80
Portage Rubber Co., The, com	½	1
Portage Rubber Co., The, 7%, pfd	1	2
Republic Rubber Corporation, com	17c	25c
Republic Rubber Corporation, 7% pfd	10	15
Republic Rubber Corporation, 8% pfd	..	2½
Rubber Products Co., The	35	60
Standard Tire Co., The, com	..	80
Standard Tire Co., The, pfd	..	80
Star Rubber Co., The, com	..	85
Star Rubber Co., The, 8% pfd	..	90
Swinehart T. & R. Co., The, com	..	40
Swinehart T. & R. Co., The, 7% pfd	..	70

New York Stock Exchange Quotations

NOVEMBER 22, 1921

	High	Low	Last
Ajax Rubber Co., Inc.	17½	16⅛	16⅞
Fisk Rubber Co., The	10⅛	10	10⅛
Goodrich Co., B. F., The	31¼	31	31¼
Goodrich Co., B. F., The, pfd.	81	81	81
Kelly-Springfield Tire Co.	40¾	40¼	40⅜
Keystone T. & R. Co., Inc., The	10	9⅝	9⅝
Lee R. & T. Corporation	27⅛	27⅛	27⅛
United States Rubber Co.	48¾	48¼	48¼
United States Rubber Co., 1st pfd.	94½	94	94

New Incorporations

Anderson & Davis Co., September 20 (Illinois), $10,000. W. E. Anderson, S. L. Davis, and G. R. Parsons. Principal office, 910 South Michigan avenue, Chicago, Illinois. To buy, sell, manufacture and generally deal in automobile casings and tubes and rubber products of all kinds.

Benjamin-Johnstam, October 15 (Massachusetts), $150,000. B. J. Stam, president; E. M. Blake, vice-president; M. H. Stam, treasurer. Principal office, Stoughton, Massachusetts. To manufacture shoes, having a rubber slip between the welt and the outersole.

Braender Rubber & Tire Co., November 3 (Delaware), $1,000. The board of directors are: M. Daumann, H. Cross, J. K. Watson, C. E. Shreffler, R. Boyd, C. A. Horton, R. J. Trimble, J. M. Detjen, and F. L., W. P. and H. Braender. Principal office, 7 West 10th street, Wilmington, Delaware. To manufacture, sell and deal in tires.

Century Plainfield Rubber Co., October 28 (Delaware), $30,000. H. McInerney, 220 West 42nd street, New York; M. B. Kennelly, 345 Willett avenue, Port Chester—both in New York; A. G. Armstrong, Moseley, Virginia. Delaware agent, C. V. Mannering, 916 King street, Wilmington, Delaware. To manufacture and deal in tires and inner tubes.

Climax Heel Co., October 5 (Delaware), $10,000. C. T. Cohee; C. B. Outten; S. L. Mackey—all of Wilmington, Delaware. Delaware agent, Corporation Service Co., 921 Market street, Wilmington, Delaware. To manufacture rubber heels.

Corona Manufacturing Co., October 24 (Delaware), authorized capital stock 100 shares without nominal or par value. T. L. Croteau, M. A. Bruce, C. H. Maxwell—all of Wilmington, Delaware. Delaware agent, Corporation Trust Co. of America, Du Pont Building, Wilmington, Delaware. To manufacture and deal in rubber goods.

Durant Tire & Rubber Co., Inc., November 4 (New York), $30,000. G. Young, 64 West 96th street; A. Knopfer, 74 Columbia street, both of New York; R. Weiss, 7 Glendale Place, Brooklyn—both in New York. To manufacture tires.

Ever Stick Products Corporation, The, November 10 (New York), $25,000. B. Rosenthal, 36 Highgate avenue; S. Marcovitz, 253 Hickory street; J. A. Ford, 119 Oakland Place—all of Buffalo, New York. Principal office, Buffalo, New York. To manufacture rubber goods.

Evergreen Tire Co., September 3 (Oklahoma), $2,000. C. McMackin; G. H. Carter; M. S. Largey—all of Tulsa, Oklahoma. Principal office, Tulsa, Oklahoma. To sell tires.

Fox Tire & Rubber Co., Inc., October 28 (New York), $500. E. R. Dodge; M. R. Roche; J. M. Detjen—all of 61 Broadway, New York City. To manufacture tires and rubber goods.

General Packing & Rubber Co., October 13 (Maryland), $10,000. Z. R. Lewis, 816 St. Paul street; E. J. D. Cross, 114 East Eager street; E. R. Simpson, 1004 American Building—all of Baltimore, Maryland. Principal office, 28 South Charles street, Baltimore, Maryland. To deal in rubber goods and do a packing business.

Hanner-Swanger Co., The, October 4 (Ohio), $25,000. G. S. Shaeffer, president; F. C. Swanger, vice-president; C. A. Hanner, secretary and treasurer; W. R. Hanner, manager. Principal office, Corner Cleveland avenue and Fourth street, N. W., Canton, Ohio. To buy, sell and deal in tires, tubes, etc.

Hellman Bros. American Auto Tire & Supply Co., Inc., October 24 (New York), $10,000. A. and E. Hellman, both of 31 West 111th street; M. B. Hellman, 1451 Wilkins avenue—both in New York City. To manufacture auto tires, etc.

Keith, Perkins & Ware Tire Co., August 29 (Alabama), $10,000. S. P. Keith; C. R. Perkins; M. S. Ware. Principal office, Bessemer, Alabama. To deal in tires.

Kling, Inc., Ernest F., November 14 (New York), $50,000. E. F. and Elsa Kling; W. S. Kane—all of Batavia, New York. Principal office, Batavia, New York. To deal in tires.

M. & W. Tire Co., September 30 (Alabama), $10,000. T. A. and E. Morrison; H. Watkins—all of Birmingham, Alabama. Principal office, Birmingham, Alabama. To deal in tires.

Michigan Rubber Heel Co., The, October 24 (Massachusetts), $15,000. H. W. Lang, president; F. L. Blackhurst, treasurer and clerk; W. H. Burgess, director—all of Sears Building, Boston, Massachusetts. Principal office, Boston, Massachusetts. To buy, sell and deal in rubber and fiber products.

Middletown Raincoat Co., Inc., November 16 (New York), $20,000. M., P. and L. Douglin—all of 571½ Cottage street, Middletown, New York. Principal office, Middletown, New York. To manufacture rubber coats.

Midwood Tire & Accessories Co., Inc., November 9 (New York), $10,000. J. Antell, 1407 Lincoln Place; L. Appelbaum, 454 East 46th street; A. Berg, 761 Blake avenue—all of Brooklyn, New York. Principal office, Brooklyn, New York. To deal in automobile supplies.

Miles-On Co., November 3 (Delaware), $60,000. K. L. Eddy; A. W. Rennacker; J. L. McDonnell. Delaware agent, Corporation Trust Co. of America, Du Pont Building, Wilmington, Delaware. To deal in tires.

Monongah Auto Supply Co., September 19 (West Virginia), $50,000. K. C. and C. Curry; S. B. Hall, J. D. Anthony; G. M. Stewart—all of Monongah, West Virginia. Principal office, Monongah, West Virginia. To deal in tires and automobile accessories.

New York State Simplex Rim Corporation, October 26 (New York), $50,000. G. McCutcheon, Buffalo; B. W. Welch, Batavia, both in New York; H. G. Wilder, Akron—all in New York. Principal office, Akron, Erie County, New York. To deal in and manufacture automobile accessories.

Nottingham Rubber Co., November 3 (New Jersey), $500,000. C. F. Fisk, 150 East State street; I. Alexander—both of Trenton, New Jersey; S. H. Bell, Reading, Pennsylvania. Principal office, 150 East State street, Trenton, New Jersey. To manufacture and sell tires and inner tubes.

Old Hickory Tire Co., November 4 (Delaware), $2,000,000. F. L. and M. E. Mettler; P. M. Gilkey—all of Wilmington, Delaware. Delaware agent, F. L. Mettler, 832 Market street, Wilmington, Delaware. To manufacture automobile accessories.

Paraflex Rubber Corporation, November 14 (New York), $30,000. A. W. Palmer; V. A. Heberts, both of 27 Cedar street; O. L. Gonzalez, 65 Barclay street—both in New York City. To manufacture rubber goods.

Sacks Service, Inc., October 31 (New York), $10,000. C. C. Sacks, 3 West 104th street; R. Graves, Jr., 203 West 72nd street; C. C. Graves, 302 Central Park West—all of New York City. Principal office, Mt. Vernon, New York. To deal in tires, etc.

Sectional Tire Works, Inc., The, October 26 (Delaware), $60,000. M. L. Rogers; L. A. Irwin; W. G. Singer—all of Wilmington, Delaware. Delaware agent, Corporation Registry Co., 100 West 10th street, Wilmington, Delaware. To manufacture and deal in tires.

Seiberling Rubber Co., November 16 (Delaware), authorized capital stock $5,000,000 preferred, $100 par value, and 500,000 shares common without nominal or par value. T. L. Croteau, M. A. Bruce, and C. H. Blaske—all of Wilmington, Delaware. Delaware agent, Corporation Trust Co. of America, Du Pont Building, Wilmington, Delaware. To manufacture and deal in gutta percha and rubber goods of all kinds.

Seven One Seven Tire Service, Inc., October 7 (Texas), $25,000. W. T. Eldridge, Jr., president; E. M. Allison, vice-president and general manager; W. H. Allison, secretary and treasurer. Principal office, Dallas and Fannin streets, Houston, Texas. To deal in tires, tubes and accessories.

Stern & Co., Inc., Fred, November 14 (New York), $1,000,000. F. Stern, Pondsfield Road; L. H. Heyworth, Argyle Place, both of Bronxville; P. Elbogen, 8 West 72nd street, New York—both in New York. To deal in crude rubber, gutta percha, etc.

Travis Tire Co., September 25 (Texas), $10,000. W. B. Moss, president and general manager; J. W. Wharton, vice-president; D. Fraser, secretary and treasurer—all of San Antonio, Texas. Principal office, 207 East Travis street, San Antonio, Texas. To deal in tires and accessories.

Tri-State Tire Corporation, November 1 (Delaware), $100,000. C. T. Cohee; C. B. Outten; S. L. Mackey—all of Wilmington, Delaware. Delaware agent, Corporation Service Co., Equitable Building, Wilmington, Delaware. To manufacture tires, tubes, etc.

Tucker Waterproofing & Insulating Co., November 3 (Massachusetts), $95,000. W. R. Tucker, president; G. Tucker, treasurer, both of 664 Pleasant street; P. G. James, clerk, 678 Pleasant street—all of Brockton, Massachusetts. Principal office, Brockton, Massachusetts. To manufacture and deal in waterproofing and insulating materials.

Universal Packing Corporation, October 21 (Delaware), $200,000. F. R. Hansell; J. V. Pimm, both of Philadelphia, Pennsylvania; E. M. MacFarland, Camden, New Jersey. Delaware agent, Corporation Guarantee & Trust Co., 927 Market street, Wilmington, Delaware. To manufacture and deal in rubber goods.

PROMINENT RUBBER GOODS TRAFFIC EXPERT

John A. Moore, who for two years has ably served as a member of the Executive Traffic Committee of The Rubber Association of America, and was its chairman during 1920, has made traffic management his life work and through long and varied experience holds a high place in that field.

John A. Moore

Born in Ireland in 1873, he was educated in the National and Model schools of Ireland, graduating from the Londonderry Model School in 1889. Coming to the United States in 1890, he was for eight years in the auditing and traffic departments of the Lackawanna Railroad, four years in the traffic department of the United States Steel Corporation, three years as assistant traffic manager of the National Steel & Wire Corporation. Then came two years as traffic manager of the Sandtern Steel Co., Birmingham, Alabama, followed by five years in the same capacity for the Maxwell-Briscoe and United States Motor Companies. For nine years he has been general traffic manager of the Ajax Rubber Co., Inc., New York, N. Y., which position he now holds.

Mr. Moore has been, for a period of twenty years, a member of many important traffic committees. He has been on the board

of governors of the New York Traffic Club for three years and is on every committee of that club. He is a thirty-second degree Mason, a Shriner and a member of the Masonic and Shrine clubs, the National Freight Traffic Golf Association and several other clubs.

The Rubber Trade in The East and South

The Trade in Manufactured Goods

Seasonal conditions and the approach of the annual inventory period have resulted in lessening rubber manufacturing activity. Mechanicals are quiet with factories operating on the average at less than half capacity. Tire manufacturers were hard hit by the severe reductions in consumers' prices which took effect during the first half of November. Dealers have not yet responded to the cut with the hoped for increased demand, although their reaction must soon be evident. Sales of solid tires have shown monthly improvement during the fall and at present are at about half normal, with the outlook favorable.

Automobile topping has recently had a spurt, but December is looked forward to as a duller month. There is little activity in clothing. Insulated wire production is in fair volume, the same as for the past few months. The active season is due in January and February. Boot and shoe factories are on reduced tickets at present. Last winter's consumption of rubber footwear was somewhat under normal, leaving dealers in less than the usual seasonal need of new stocks.

New York

During automobile show week an automotive equipment show will be held January 9-20 at the Hotel Imperial, Broadway, 31st and 32nd streets, New York, N. Y., admission to the exhibition will be restricted to members of the Association, although many "courtesy memberships" have been issued. Space without charge is given to all exhibiting manufacturers, unless a sale is made. In that case 7½ per cent of the amount of the sale is given to the Association, five per cent being used to cover charges for advertising and other expenses, while the remaining 2½ per cent is rebated to those accessory buyers who are members of the Association.

Officials of The Fisk Rubber Co., 52 Vanderbilt avenue, New York, N. Y., deny the statement recently made that the name of the organization had been changed to Fisk Tire Co. The latter designation applies, however, to the sales organization for the Fisk Division of the company. The Fisk Rubber Co., as at present constituted, includes the following divisions: The Fisk Division, at Chicopee Falls, Massachusetts; the Federal Division, at Cudahy, Wisconsin; and the Ninigret Division, at Pawtucket and Westerly, Rhode Island. Another sales organization recently formed to work with the Federal Division will be known as the Federal Rubber Company of Illinois.

William A. Bechberger, in charge of fabric purchasing for The Fisk Rubber Co., New York, N. Y., has resigned to take effect January 1, 1922. The resignation has been accepted with regret by the Fisk company, as it terminates a period of 14 years of service. Mr. Bechberger was for 10 years purchasing agent of the company in Massachusetts, until it opened its fabric and rubber purchasing department in New York, when he was transferred. He now plans to retire from business for six months or a year.

It is announced that the crude rubber brokerage firm formerly known as Horn & Leavitt has been succeeded by E. A. Leavitt. The business will be continued at 50 Broad street, New York.

Among the officials elected by the National Safety Council at its first meeting following the Tenth Annual Safety Council the following name was noted: B. F. Tillson, The New Jersey Zinc Co., 160 Front street, New York, N. Y., vice-president for industrial safety.

In another section of this issue reference is made to a tire of recent manufacture, produced by the Burlock Non-Skid Tire Corporation, 828 Seventh avenue, New York, N. Y. Claims made by this organization that its tires are "non-skidding" are confirmed by statements issued from the Police Department, New York, N. Y., by whom these products have been used. Officers of the Burlock company are: E. F. Spiegel, president; James C. Burlock, vice-president; C. E. A. Spiegel, treasurer; and W. D. Beardsley, secretary and sales manager.

The Fibre Tire & Rubber Co., Inc., Gotham National Bank Building, 1819 Broadway, New York, N. Y., has been organized to manufacture "Fibre Tread" cord tires, inner tubes, and other products from fiber and rubber. Two acres of land and a new factory have been purchased at Babylon, Long Island, and work will soon be started on two other new buildings in which to make tires. It is hoped to begin production by the first of the year. Negotiations are also under way for another factory in New Jersey. The officers of the new company, which is capitalized at $3,000,000, are: Edward F. Stoeckle, president; Charles Dunster, vice-president; Leland E. La Bar, treasurer; Michael N. Salamon, assistant treasurer; and W. B. Holton, secretary.

Beginning January 1, 1922, Henry L. Hughes Co., Inc., with factories for the manufacture of toilet brushes at Second street and Ninth avenue, Troy, N. Y., will produce one of the company's specialties in a new plant at 295 Vernon avenue, Long Island City, N. Y. Rubber-cushion hair brushes will be made in this building, which is equipped for this purpose, and is modern in every respect. M. W. Alexander is vice-president of the Hughes company, whose New York City offices and salesrooms are at 114 East 16th street.

The Achilles Rubber & Tire Co., Inc., Binghamton, New York, is building a new power plant to accommodate additional equipment, so that it may increase its output to more than four times its present capacity. In addition to the manufacture of tires and inner tubes, the company has secured a contract to manufacture a patented rubber heel which is claimed to have superior features. The officers of the company are: Harry J. Smith, president and general manager; Ashton W. Caney, vice-president and sales manager; and George L. O'Neill, secretary and treasurer.

Pennsylvania Notes

W. S. Wolfe, K. B. Kilborn, and W. P. Keith, formerly with The Goodyear Tire & Rubber Co., Akron, Ohio, as development manager, experimental engineer, and chemist, respectively, are to be associated with Frank A. Seiberling, president of Lehigh Rubber Co., New Castle, Pennsylvania.

The Lehigh Rubber Co., New Castle, Pennsylvania, owned by F. A. Seiberling, has started production of tires in addition to the tube business with which the plant was placed in operation. Approximately 300 tires and 1,000 tubes are being made daily.

On November 1 the Quaker City Rubber Co. began operations in the latest addition to its plant, a new five-story construction at 624-26-28 Market street, Philadelphia, Pennsylvania. This building, which houses the company's main offices and salesrooms, is of Indiana limestone and tapestry brick, with interior equipment that is modern in every respect. Well-appointed offices for executive and clerical forces have been arranged, while ample space for shipping and receiving materials has been provided. A more extended notice, giving an outline of this company's development, appeared in the October issue of THE INDIA RUBBER WORLD.

The offices of the Morse Chain Co., Ithaca, New York, in Philadelphia, Pennsylvania, have been removed to the Fuller Building, 10 South 18th street. Officials of this company, which manufacture frictionless rocker joint chains and high speed silent gearing for power transmission, are at present as follows:

F. L. Morse, president and treasurer; E. T. Turner, vice-president; D. B. Perry, secretary, and C. L. Saunders, advertising manager.

New equipment, valued at more than $50,000, and consisting mostly of tire machines, vulcanizers and molds, is being installed at the plant of the Traveler Rubber Co., Bethlehem, Pennsylvania. Officials of the company state that this new machinery is being set up in order to take care of orders already placed, and that, according to present outlook, the year 1922 will prove to be for this company the most successful one that they have yet experienced. The executive personnel is as follows: Guy De la Rigaudiere, president; Victor Durand, Jr., first vice-president; G. J. P. Raub, second vice-president; and E. E. Pollard, secretary and treasurer.

A surprising record of rapid growth and progress is exemplified by the Hydro-United Tire Co., Inc., Charlotte and Hanover streets, Pottstown, Pennsylvania. This organization, which began operating two years ago with a daily production of 20 tires, has at present a capacity of 1,200 tires a day. During the past season, however, owing to unprecedented orders, the company could supply only 20 per cent of the demands made upon it. As a result an addition to the plant became necessary, and this new construction, now going forward, and which will double the present plant capacity, will cost approximately $250,000. Operations will not stop here, however, for plans are already being formulated for a new plant to be built during the coming spring, a structure where 10,000 tires a day can be produced. C. A. O'Neill is vice-president of the company.

Southern Notes

The Cumberland Tire & Rubber Co., Inc., Louisville, Kentucky, has appointed A. W. Venner general manager. Mr. Venner has had thirty-two years' experience in the rubber industry. During this time he was 24 years with The B. F. Goodrich Co., Akron, Ohio, of which 8 were in the experimental laboratory; superintendent 5 years of The Gibney Tire & Rubber Co., Conshohocken, Pennsylvania; plant superintendent of the same factory 1½ years after the Gibney company was bought by The Fisk Rubber Co., Chicopee Falls, Massachusetts; and production superintendent another 1½ years for the Fisk company after it moved to Chicopee Falls the machinery and equipment of the Gibney plant.

The Paul Rubber Co., Salisbury, North Carolina, manufacturer of tires and tubes, is now putting out the "Kiddie Bath," a portable bath tub for infants, made with a folding frame. W. M. McConnell is president of the company and Samuel Adinoff is superintendent. Mr. Adinoff was formerly chemist for the Gillette Rubber Co., Eau Claire, Wisconsin.

Building operations began recently at Huntington, West Virginia, in connection with the new branch of the Westinghouse Electric & Manufacturing Co., whose general offices and main works are at East Pittsburgh, Pennsylvania. The new three-story plant at Huntington which will be 100 feet square and of brick and steel construction, will cost approximately $100,000. The Westinghouse company, which is the second largest concern of its kind in the country, will at this new branch attend to the needs of its patrons in four states—West Virginia, Ohio, Kentucky and Tennessee.

The Rubber Trade in New Jersey

Trenton Notes

The annual meeting of the Rubber Manufacturers' Association of New Jersey will be held at the Trenton Country Club on Monday, December 12. President John S. Broughton will preside and officers will be elected and other business transacted.

The Miller-Steiner Rubber Co., Trenton, New Jersey, is preparing to make a new line of rubber products, specializing in molded goods. The company purchased the Olden Rubber Co. plant and is making alterations and installing new machinery. Radiator hose, inner tubes and pump valves will be among the products. John M. Miller is president and general manager of the concern, while Julius B. Steiner is secretary-treasurer.

At a meeting of the stockholders of the Thermoid Rubber Co., Trenton, New Jersey, called by J. Oliver Stokes, president of the company, the board of directors was increased from four to nine members. Those constituting the board for the ensuing year are: J. Oliver Stokes, William J. B. Stokes, Robert J. Stokes, Fredrick S. Wilson, J. O. Bauer, Edmund W. Craft, William D. Pardoe, Ellis L. Pierson and John T. Spicer.

Harold Rogers, secretary and treasurer of the Grizzly Rubber Co., Trenton, New Jersey, who was injured on October 27, in an automobile accident, is slowly recovering at Mercer Hospital. His brother, Richard R. Rogers, president of the Grizzly company, was slightly injured at the same time.

Peter D. Thropp, treasurer of the John E. Thropp's Sons Co., Trenton, New Jersey, manufacturer of rubber machinery, is home again after undergoing a serious operation at the Atlantic City Hospital, Atlantic City.

With the appointment of Edward Duer as receiver for the Rubber Corporation of America it is hoped to conserve the assets of the company so that it could be either liquidated or reorganized in conjunction with the Empire Rubber & Tire Corporation, Trenton, New Jersey. Action against the Rubber Corporation of America was taken by the Equitable Trust Co., which holds a note for $70,000. The liabilities are listed at $900,000 while the assets are approximately $1,030,000.

Arthur H. Wood and C. Edward Murray, Jr., receivers of the Empire Rubber & Tire Corporation, which was adjudged insolvent March 23, 1921, were recently summoned to appear in the United States District Court at Newark to show cause why the DeLaski & Thropp Circular Woven Tire Co., should not be granted relief on a $23,354.26 judgment secured in a suit in 1916 against the Empire Rubber & Tire Co. The order was on motion of E. Clarkson Seward, solicitor, and Thomas G. Haight, counsel for the petitioner, and was signed by Federal Judge Joseph L. Bodine. The Empire company asked for more time in the case and the court granted an extension.

The Nottingham Rubber Co., Trenton, New Jersey, has been incorporated with a capital of $500,000 for the purpose of manufacturing and selling automobile tires and tubes as well as accessories and rubber goods generally. The incorporators are: Samuel H. Bell, Reading, Pennsylvania, president; C. Francis Fisk, vice-president and general manager; and Isadore Alexander, secretary, both of Trenton.

The company will shortly erect a plant near Trenton, where an option has been secured on a plot of ground. One of the products will be a patent inner tube invented by Mr. Fisk who has sold the Canadian rights to the Premier Tire & Rubber Co., Limited, Toronto, Canada. Dealers in New York, Pennsylvania, Maryland and Delaware have the exclusive rights for the Fisk tube, while in other states the tube will be sold through one state jobber.

The Ajax Rubber Co., Inc., Trenton, New Jersey, has made a number of alterations in its East Trenton plant at a cost of $2,000.

The Hamilton Rubber Manufacturing Co., Trenton, New Jersey, has made some alterations in the compound room including a new roof.

The plant of The Enterprise Rubber Co., Trenton, New Jersey, a two-story brick structure for the manufacture of rubber specialties, was completely destroyed by fire on October 21, resulting in a loss of about $25,000. The blaze was of unknown origin and started in the basement. The firemen after hard work managed to keep the fire away from a nearby tank

containing 1,000 gallons of benzine. John McCue, owner of the factory, has not yet decided whether he will rebuild.

Miscellaneous New Jersey Notes

At a meeting of the Rubber Manufacturers' Association of New Jersey, held recently at the Trenton Country Club, the Howe Rubber Corporation, New Brunswick, New Jersey, was admitted to membership.

The Howe Rubber Corporation, New Brunswick, New Jersey, a Delaware corporation, with a capital stock of $4,000,000, has been licensed to do business in Illinois. Of this the amount of capital to be used in the business in Illinois is $853,200. W. T. Alden will be the Illinois representative, and the principal office will be at 134 La Salle street, Chicago. The officers of the company are John Tenny, Jr., Plainfield, New Jersey, and Ambrose Hardenbergh, New Brunswick, New Jersey, secretary. Hugh A. Kerr has been appointed controller and J. T. Johnson, general factory manager and technical engineer.

The Haywood Rubber Co. has purchased a building on West Broad street, Burlington, New Jersey, and will engage in the manufacture of inner tubes and rubber accessories. William G. Zimmerman, of Philadelphia, Pennsylvania, president and general manager of the new concern, has let a contract to the John E. Thropp Sons Co., Trenton, for the building of the rubber machinery. The company is making some alterations to the building and will begin operations as soon as possible.

The Stanwood Rubber Co., with a plant at Elizabeth, New Jersey, is planning to open the factory again, and will issue $175,000 worth of 8 per cent preferred stock, $151,000 worth of 8 per cent second preferred, and $500,000 shares of no par value common. The $600,000 creditors' claims will be paid 50 per cent in debentures bearing no interest, and 50 per cent in common stock at the rate of $2 a share.

Don Stevens, formerly head of the labor department of The Goodyear Tire & Rubber Co., Akron, Ohio, has accepted the managership of the Okonite Co., Passaic, New Jersey, manufacturer of insulated cable.

Recent changes in the sales forces of The Braender Rubber & Tire Co., Rutherford, New Jersey, include the following: M. B. Page and Louis N. Walton are now selling Braender tires and tubes through the company's Philadelphia branch, and plan to cover the Pennsylvania district; P. H. Lang is to travel from the factory, and J. P. VandeNorth from the Chicago branch. Officers of The Braender Rubber & Tire Co. are: Fred. L. Braender, president; Harry Braender, vice-president; W. P. Braender, secretary-treasurer; Edwin Braender, assistant secretary.

The Rubber Trade in Massachusetts

The Trade in Manufactured Goods

The tide of general business among Massachusetts rubber plants continues to come in, each month showing a gradual improvement. While there are seasonable recessions in certain branches as winter approaches, notably tires, due to the usual slowing down of automobile production and the end of the autumn driving season, the rubber industry as a whole is in better condition than a month ago, and there is certainly more optimism. Few manufacturers are looking for rapid improvement, so that if present progress continues, expectations will have been fulfilled and further confidence inspired.

Fall rains and early snows in northern New England and the Middle West have stimulated retail sales of light rubber footwear and relayed further orders along to the manufacturers, all of whom are now very busy and still recruiting their forces. A normal winter at least, possibly more severe, is anticipated.

The demand for mechanical rubber goods is improving and the busy season in druggist's sundries finds business brisker than during the past two years. Encouraging reports are being received from the clothing branch of the trade.

Boston Notes

Between six and seven hundred members and guests attended the sixth annual meeting of the Associated Industries of Massachusetts, held October 27 and 28 at the Copley Plaza and Westminster hotels. There were numerous prominent speakers on timely subjects, and the leading industrial, commercial and financial questions of the hour were discussed. At the business session William H. Gleason, former treasurer of the Revere Rubber Co., Chelsea, was reelected treasurer and a member of the executive committee of the association. Among the other members of the executive committee may be mentioned Frederic C. Hood, treasurer, Hood Rubber Co., Watertown; Richard H. Rice, manager, General Electric Co., West Lynn; Edward F. Green, treasurer, Crompton & Knowles Loom Works, Worcester.

It is announced that A. S. Carlton has been recently elected president of the Union Chemical Co., 27 Haymarket Square, Boston, Massachusetts. Industrial chemicals for all purposes are specialties of this company.

The Larkide Co., 201 Devonshire street, Boston, is marketing under the trade-mark name "Larkide" a new sole which is asserted to be superior to leather in wearing quality and lower in price. The material is made in shades to match all upper leathers, drills, canvas or fabric, and the claims are that it is not affected by acids; will not crack, bulge or deteriorate in stock at any temperature; does not harden, buckle or rot; and will not absorb moisture, burn the feet, slip on wet pavements or be depressed by pebbles.

The Dryden Rubber Co., of Chicago, Illinois, has established a Boston branch at 12 Columbia street with William L. Feeney in charge. A large stock of the firm's rubber heels and soles will be carried for the shoe manufacturing and jobbing trade.

Miscellaneous Massachusetts Notes

Effective November 1, the Boston Woven Hose & Rubber Co., Cambridge, Massachusetts, reduced wages and salaries from 5 to 15 per cent, affecting every department in the company, from the president down, the average reduction on labor being 10 per cent. Wages had been increased from 25 to 110 per cent above the pre-war average, and this cut which follows one of 10 per cent last March, reduced wages on the average a total of 20 to 22½ per cent. The business of the company is heavier than for many weeks, the plant running at 60 to 70 per cent of normal and being especially busy in the tape, heel, tube and matting departments.

K. J. Quinn & Co., Inc., 481 Chelsea street, East Boston, Massachusetts, manufacturer of rubber cement, has consolidated its Boston and East Boston plants at the above address, thereby increasing efficiency and decreasing expense.

The Avon Sole Co., Avon, Massachusetts, has announced its intention to exhibit its product at the forthcoming Shoe Style Show to be held in Chicago, Illinois, in January.

The Hanover Rubber Co., of West Hanover, Massachusetts, expects by its sales drive recently launched to increase its production of rubber heels from 50,000 pairs per day to 65,000 or better. Harry T. Fogg, sales manager, is personally covering New York City and state, while Raymond B. Tompkins, formerly of the sole and heel department of the United States Rubber Co., is covering the Boston and North Shore territories.

It is reported that 84 per cent of all the shoes being made in Brockton, Massachusetts, one of the greatest shoe manufacturing centers of the country, are going out with rubber heels attached. As indicating the widespread use of rubber heels, both as original equipment and for replacements, The Rubber Association of America estimates from its questionnaires among manufacturers that 125,000,000 pairs were made and sold in this country during the year 1920.

Plymouth Rubber Co. May Be Sold

The trustees of the Plymouth Rubber Co., manufacturer of rubber heels and soles, proofed fabrics and artificial leather, of Canton, Massachusetts, who have been operating the business at a satisfactory profit since early in January, have been granted permission by the court to sell the assets of the bankrupt estate at public or private sale, in whole or in part, at their discretion.

An offer of $600,000 cash from Max E. Brenkopf, 73 Tremont street, Boston, for all the assets of the estate has been declined by the trustees, following a meeting of the creditors.

On September 1, 1921, the trustees reported having in their possession the following assets: Cash on deposit, $332,515.71; accounts receivable for merchandise sold by the trustees, $144,742.13; and for sales prior to the bankruptcy proceedings, $83,308.43, the latter believed to be of doubtful value; cash on deposit with a surety company, $30,000, deposited just prior to the failure as surety for a bond given to dissolve an attachment made within four months prior to the bankruptcy and believed to be recoverable to the estate; claims aggregating $113,020.64 in litigation against four banks to recover bank deposits applied on loans shortly before the bankruptcy; merchandise inventory $241,071.75 at current market value, including raw materials, goods in process and finished product, which probably would realize considerably less than this sum on liquidation; real estate, buildings, water rights, machinery, etc., located at Canton, which the bankruptcy appraisers placed at $205,764.

The liabilities of the estate were scheduled by the bankrupt company at $1,704,181.53.

Firestone-Apsley Rubber Co.

L. D. Apsley, president of the Apsley Rubber Co., Hudson, Massachusetts, announces his company's merger with the Firestone Tire & Rubber Co., Akron, Ohio, a consolidation to have hereafter the title of the Firestone-Apsley Rubber Co. The change is expected to be especially beneficial to the Apsley company, as advantage can be taken of the resources and progressive policies of the Firestone company, while the Apsley organization will endeavor, as in the past, to render to its customers its best attention and services.

The Rubber Trade in Ohio

The Trade in Manufactured Goods

Outstanding in the past month's developments was the price reduction in automobile and truck tires which had been agitated by forces outside of the rubber industry for the past four months. Early in the month the Firestone Tire & Rubber Co., Akron, announced a 20 per cent reduction on cords, and 10 per cent on fabric and truck tires. The other manufacturers were taken by surprise, and it was not until the middle of the month that the Firestone cut was followed by other Akron concerns, together with several of the large outside companies.

During the reduced tire price talks, however, sales materially fell off, but it is believed that the definite announcement by all manufacturers of prices approaching rock bottom will mean new confidence on the part of the dealers and will lead to their restocking during the winter for spring business.

The cut on the part of the legitimate manufacturers will make it more difficult for "gyp" manufacturers to obtain business by cutting far below the legitimate list and thus sapping the business. With prices at rock bottom the dealers and public will again turn to the branded tire which now can be purchased at a price very nearly that of the shoddy tire.

The Goodyear Tire & Rubber Co., The Miller Rubber Co. and The General Tire & Rubber Co.'s reductions announced for November 15 average 20 per cent on cords, 10 to 20 per cent on fabrics and 10 per cent on trucks. The reductions, however, run from 10 to 30 per cent through the whole list. Goodyear did not cut the price of truck tires at the same time the other reductions were announced.

Tire prices are now at the lowest point in their history, and the average tire will give twice the amount of service previously rendered. The cut just announced is the third material reduction within the year, and brings the prices from 30 to 50 per cent below those of a year ago.

Definite announcements are lacking but it is believed in some quarters that, because the manufacturers made the reductions reluctantly and under protest, the cost of manufacture did not warrant a reduction at this time, and that it may be followed by a further adjustment in wages at the Akron factories.

In other lines the manufacture of rubber goods is holding up well. Tire production except for the short period of the price reductions will probably run better than 70 per cent of normal on the whole. Mechanical goods production remains below normal but indications are that the improvement which has been noted during the past two months will continue with the improvement of general business conditions. The footwear and druggists' sundries departments are running very close to normal, and the latter departments of some of the factories are now operating a night shift. Some of the specialty factories, which are the smallest of any in Akron, are doing an exceedingly good business in spite of the fact that the present is considered the dull period of that branch of the industry.

The employment situation remains static. It is the plan of the Akron companies to retain the employes now on the pay-roll and to resort to broken schedules if the trade becomes unexpectedly dull.

With Goodyear heard from and partial reports from the other manufacturers it is safe to predict that the forthcoming balance sheets will indicate that the present year is what has been termed by men in the industry as "the miracle year" in rubber, the year in which the impossible in the way of working off inventories and converting them into cash has been accomplished.

Akron

The Henry Cord Tire Co., recently organized in Akron, Ohio, is installing the Swinehart spring steel tire molds in several of the smaller tire factories in that city and will market their production, a 30 by 3½ cord tire. It is planned to equip other factories with these molds as soon as required by the demand for these tires. M. Rosenblat is president of The Henry Cord Tire Co.

The Roslee Rubber Co., with general offices at 227 Ohio Building, Akron, Ohio, was recently organized to carry on a brokerage business in manufactured rubber goods such as toy balloons, mats and matting, belts, tires, shoes, gloves, etc. Among the products that will be marketed under "Roslee" brand are the "KnuklfiT" surgeons' gloves described in THE INDIA RUBBER WORLD, March 1, 1920, and manufactured by the Lincoln Rubber Co., Akron; also toy balloons, inflated balls, and sponge rubber balls. The balloons include assorted colors and different types such as self-closing valve, squawker, wood twist valve, and novelties. The company makes a small extra charge for printing advertising balloons with special designs from cuts furnished by the customer.

The Goodyear Tire & Rubber Co., Akron, Ohio, has appointed Burgess Darrow and R. P. Dinsmore to be development manager and chief compounder, respectively. Both are now with the Los Angeles plant. V. V. Messer will assist the Goodyear machine design department in Akron as consulting engineer.

In transferring its export department from New York City to the main plant at Akron, Ohio, the Firestone Tire & Rubber Co. has also brought to the Akron general offices G. T. Currier, F. C. Allen, W. H. Snyder and G. L. Livingston. The warehouse and shipping departments for the export trade remain, however, in New York under the direction of L. A. LaTour.

F. S. Griffin, who was recently appointed head of the machine design department at the Municipal University of Akron, Akron, Ohio, has had about ten years' experience with some of the rubber companies of that city. He has held various important positions

with the Firestone Tire & Rubber Co., having had charge of designing the calenders for the Firestone Canadian plant, while much of his time has been devoted to the design, installation and equipment of mills, washers and calenders.

A. C. Horrocks, formerly connected with the Goodyear Industrial University, has organized a company of Goodyear men to take over the Denmead Rubber Co.'s plant in East Akron, Ohio, for the purpose of manufacturing heels and belting. Associated with Mr. Horrocks are: L. W. Akins, H. T. Young, H. A. King, and B. R. Beckwith.

The Mason Tire & Rubber Co., Akron, Ohio, has announced new divisions of sales territory to increase efficiency of the sales department. The east central district, which includes Ohio and the South, has been placed in charge of H. P. Campbell, formerly manager of the Cleveland branch; the west central district, including Chicago and the Middle West, is in charge of George C. Van Veen, oldest Mason salesman and for the past two years head of the Chicago branch. W. J. Ruckert, for the past six months head of the former eastern division, is in charge of the western division which includes Kansas City and southwestern territory; and C. W. Dinnison, formerly in charge of Pacific Coast sales, will be head of that division under the new arrangement. The Mason plant at Kent, Ohio, is now operating with three shifts and is producing about 11,000 tires weekly on full time.

Removal of its offices from 102 South Broadway to more adequate accommodations at 46 South Broadway, Akron, Ohio, is announced by the Akron Engineering Co. This firm of estimating and consulting engineers, which devotes its energies to the needs of rubber and power plants, has the following officials: P. E. Welton, president and general manager; Carl E. Rett, vice-president; and R. E. Cartlidge, secretary and treasurer.

The reorganization and recapitalization plan of The Star Rubber Co., Akron, Ohio, proposed by the directors, will reduce the capitalization, and also reduce the par value of the common stock from $100 to no par value, and will add two men to the board of directors, making the board consist of seven instead of five members. The cause of the reorganization is the impairment of capitalization of the company through operation and inventory losses.

Harry Quine, formerly in the publicity department of The Goodyear Tire & Rubber Co., and subsequently with the National Highway Federation at Washington, has been named publicity director of The General Tire & Rubber Co., Akron, Ohio.

Hugh Allen, publicity director of The Goodyear Tire & Rubber Co., has been made chairman of the publicity campaign to raise $275,000 for The Better Akron Federation.

That the dull season in the tire industry is far from what it is normally expected to be, is indicated by the fact that the Firestone Tire & Rubber Co., Akron, Ohio, added employes to the production departments early in the month. H. S. Firestone indicated that he expected production to mount as a result of the stimulus given the trade by the lowered prices of tires.

Rubber specialties have enjoyed a very good year. The Gregory Rubber Co., Akron, Ohio, among others, reports that the rubber ball department is working three shifts a day, while a slight dropping off in toy balloon business has been experienced during the month. It is expected that the company will show a profit in spite of the general business depression.

Rubber companies have started to make fabric contracts for the coming year, and indications are that they expect an exceedingly good season. Contracts are not as large as in previous years, but they indicate that the industry believes the bottom in the fabric market has been reached.

The Goodyear Tire & Rubber Co. is perfecting an explosion-proof airplane and dirigible gas tank. It is understood to be lined with rubber and heavily covered with fabric. Several tests have been made, and it has thus far been shown to be non-inflammable.

Foreign collections are rapidly improving, according to the export departments of practically all rubber companies. One company states that it has not lost one dollar in the export field this year because of bad credits. Although the movement is very gradual, rubber exporters state that some improvement in the foreign field is being noted.

Officials of Whitman & Barnes Manufacturing Co., Akron, Ohio, state that orders are coming at a much better rate during the past month than for the past six months. Because they are scattered and widely diversified the orders are looked upon as being the harbingers of a much better business in the late winter and early spring.

Rubber companies throughout the United States have shown a revival in equipment buying. Thus far the orders have been small, but they have been sufficient to indicate to the Akron Gear & Engineering Co, Akron, Ohio, that business will soon be better. Southern Ohio, Maryland, Iowa and Nebraska are mentioned as sources of new inquiries and orders.

Goodrich Wipes Out Floating Indebtedness

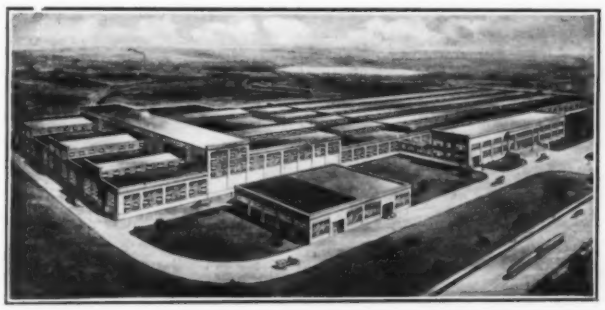
The B. F. Goodrich Co. has completed what will probably be known as its most successful year, although the profit account may not be what it has been in other years. A year ago the company had a floating indebtedness of more than $30,000,000, and at the end of the third quarter it was possible to announce reductions amounting to more than $23,000,000, with sufficient cash on hand to completely wipe out the balance.

Production is running close to 10,000 tires a day, with indications that the turn of the year will see this materially increased. The production for the whole year will be entirely dependent upon sales, as the company will stay close to the sales ticket, but it is not doubted that the first of the spring months will see one of the most surprising revivals in the tire industry it has ever witnessed.

Goodrich sales have been satisfactory, and the past few months have been utilized to put the entire organization into the best possible working shape for the coming year. A number of minor changes have been made in conformity with this plan to make it one of the smoothest working machines in the tire industry.

New Firestone Rim Plant Ready for Machinery

Construction work on the new plant of the Firestone Steel Products Co., Akron, Ohio, for the manufacture of automobile rims, is completed and ready for the installation of machinery.



Firestone Steel Products Co., Akron, Ohio

Firestone rims are standard equipment on about 60 per cent of the makes of automobiles, and with the facilities afforded by this new plant, the former capacity will be doubled.

The new rim plant, located to the south of the Firestone tire plant in Akron, is a single-story brick and steel building more

than one-sixth of a mile long. It is equipped with the blower system of heating and ventilating, making radiators unnecessary. Heavy cranes have already been installed, to be used not only in the completed factory, but for the installation of heavy machinery. Tracks connecting with the Firestone interplant railroad are laid into the building.

An office building of two stories connects directly with the factory, while an engineering building, which adjoins the plant, is approximately one-third the size of the rim building, and will be used to make tools and rim production equipment.

The total capacity of the plant will be about 25,000 rims a day, including 6,000 solid tire bases a day. The old plant, which is the original Firestone Tire & Rubber Co. building, is sufficiently large to take care of present needs, but the new plant will be utilized as soon as the expected forward movement in the automobile industry makes the change necessary.

Seiberling Rubber Company Formed

F. A. Seiberling, formerly president of The Goodyear Tire & Rubber Co., who resigned when New York bankers reorganized that company last May, has definitely announced his return to the rubber industry by the formation of a $10,000,000 corporation under the laws of the state of Delaware to be known as Seiberling Rubber Co.

C. W. Seiberling

I. R. Bailey

Frank A. Seiberling

W. E. Palmer

W. A. M. Vaughn

Officers of the Seiberling Rubber Co.

Plans are complete to offer for sale 50,000 shares of preferred stock, $100 par value and 500,000 shares of common stock, no par value, at $10 a share. Because the Delaware laws recognize only $100 par value common stock, the announcement was made that the Seiberling Rubber Co. was to be a $55,000,000 company.

The officers of the new company are: Frank A. Seiberling, president; Charles W. Seiberling, vice-president; W. A. M. Vaughn, treasurer; E. A. Palmer, secretary, and I. R. Bailey, sales manager.

Mr. Palmer was treasurer and later secretary of The Goodyear Tire & Rubber Co., Mr. Vaughn was assistant treasurer, and Mr. Bailey was connected with mechanical goods sales of that company.

Mr. Seiberling will return to the rubber industry with the Lehigh Rubber Co., New Castle, Pennsylvania, which he purchased at a receiver's sale and possibly with The Portage Rubber Co. for which he bid $750,000, the Court order of acceptance being temporarily held up by petition of the stockholders. If he obtains the Portage plant his initial output will be 5,000 tires and 6,000 tubes a day. He will probably add other companies to his list, but thus far no definite announcements to this effect have been made. Final action by the Federal Court in Cleveland regarding disposition of the Portage plant is expected soon.

Mr. Seiberling also controls The Star Rubber Co. and is a bidder for the Republic Rubber Co. in Youngstown, now in receivership.

General Pays Off Bank Loans

The General Tire & Rubber Co., Akron, Ohio, on October 26 paid off its last bank loan. A year ago last May the company owed $2,500,000, or more than its capitalization and surplus. This was reduced by the following November to $1,400,000, and completely eliminated on October 26.

The company's business has been excellent during the past year, due mainly to the fact that it has always focussed on dealers, rather than original equipment business, and for that reason its sales have showed practically no decline.

Production output for the year, according to William O'Neil, vice-president and general manager, will exceed by 30 per cent. that of 1920, the record year in the industry, although gross sales will not much more than equal the $5,755,000 of 1920, because of the price cuts in tires. Not one dividend was passed or deferred during the year, which was one of the worst the industry ever experienced.

Cleveland

Officials of the Cleveland Rubber Corporation Co., with executive offices and factory at West 114th street and Berea Road, Cleveland, Ohio, state that Augustus H. Hanna has recently been given charge of sales for the company in five counties of northern Ohio, with headquarters at 2142 Broadway avenue, Lorain, Ohio. Other districts recently opened by this organization are the following: Chicago office, 1160 Transportation Building, Chicago, Illinois, covering the northern half of Illinois and Indiana and the whole of Michigan; Washington, D. C., office, 317 Bond Building, Washington, D. C., covering the District of Columbia, Virginia, and a portion of Maryland; Cincinnati office, 813 Sycamore street, Cincinnati, Ohio, covering southern Ohio, the whole of Kentucky, and half of Tennessee; Pittsburgh office, 215 Martin Building, Pittsburgh, Pennsylvania, covering the western half of Pennsylvania and the greater part of West Virginia.

New Jersey Zinc Sales Co. Opens Cleveland Office

In order to meet the requirements of the rubber and paint industries for zinc oxide, albalith, and other products the New Jersey Zinc Co. has opened an office in the Guardian Building, Cleveland, Ohio, with R. A. Parrett, district sales manager, in charge. From this branch an attempt will be made to serve the Ohio territory, where large tonnages of the products mentioned are consumed, and from this branch requisitions will be made upon the Cleveland and Cincinnati warehouses. Other warehouse stocks have since been installed in various industrial centers throughout the country for the convenience of buyers of less than carload stocks who desire prompt delivery.

E. V. Peters, general sales manager, states that through the establishment of this sales organization the company can maintain a close relationship with its customers, and through the dis-

trict sales manager, keep in connection with the requirements of the trade.

Successful Readjustment of McGraw's Finances

The recent readjustment of the financial affairs of The McGraw Tire & Rubber Co., 4810 Prospect avenue, Cleveland, Ohio, has proved most successful. Under the plan of including in the reorganized board of directors certain representatives of banking interests and merchandise creditors the company has been able to effect very satisfactory settlement of contracts. Reduction of indebtedness to banks and merchandise creditors aggregating $400,000 has been accomplished since the plan became operative. In addition all current purchases are discounted and ample cash is in the treasury to provide working capital. The profits for the quarter ended September 30 have aggregated $227,000; the company has ample working capital for present needs; and no new financing is contemplated.

The plant, with no changes in the official management, is now operating two 10-hour shifts a day, and orders in hand will necessitate, it is claimed, increase of production in the near future.

First Annual Convention National Tire Dealers' Association

The first annual convention of the National Tire Dealers' Association, held in Cleveland October 18, 19 and 20, proved a decided success. Over forty cities were represented, the attendance indicating a remarkable growth in the actual membership of the organization.

The election of officers resulted as follows: R. F. Valentine, president of the Cleveland Retail Tire Dealers' Association, and first vice-president of the National Association, becomes president, while Frank Zeman, president of the Chicago association, was chosen vice-president of the National Association. Directors include: Thomas F. Whitehead, R. R. Wooley, E. P. Farley, R. J. Walters and E. J. Methudy. The resignation of Philip O. Deitsch, who has served as secretary of the association since its inception, having been accepted, J. W. Matheny, secretary of the Cleveland association, was chosen to temporarily fill the vacancy.

Among the subjects particularly emphasized at the meeting was the question of mileage guarantees, and discontinuances of these guarantees by reputable tire manufacturers or adjustments by manufacturers through their authorized dealers was urged and passed by resolution. It was also urged that adjustments, if made, be based upon the price paid by dealers. From start to finish much interest and enthusiasm was displayed by attending members, while the rapid wiping out, by subscription, of a deficit which had been facing the organization assures its financial future.

Miscellaneous Ohio Notes

J. E. Henderson has been appointed sales manager of the tire department at the Cincinnati, Ohio, branch of The Brunswick-Balke-Collender Co., Chicago, Illinois.

Some construction work at the plant of the Erie Tire & Rubber Co., Sandusky, Ohio, is at present under way, and the exterior of the buildings is being completed. This will put the structures into condition so that additional space, when necessary, can be made use of. The plant passed into the hands of H. R. Greenlee, as receiver, several months ago.

Among the large distributers of the products of the McKone Tire & Rubber Co., Millersburg, Ohio, who are also stockholders in the parent company, are the following: The Conley-Hussey Co., Chicago, Illinois; Gustin-Bacon Manufacturing Co., Kansas City, Missouri; E. J. Methudy, St. Louis, Missouri, and other well-known firms. The McKone Tire & Rubber Co., with general offices at 1943 McCormick Building, Chicago, Illinois, manufactures McKone fabric and cord casings and inner tubes.

Ray F. Hamlin and John M. Crawford have been appointed receivers of the Avalon Rubber Manufacturing Company, Barberton, Ohio. Accounts payable are said to be more than $25,000, with assets of $200,000.

The Interlocking Cord Tire Co., Mogadore, Ohio, has been placed in operation by the reorganized company headed by Edward Kohl, president, and W. N. Burkhart, general manager, and production is now 50 tires a day. The present capacity of the plant is 150 tires a day. The company is specializing in a 30 by 3½ tire to increase the efficiency of the plant and also to find a ready market for its product. Mr. Kohl is of the opinion that the plant will have sufficient business to speed up production in the very near future.

At the annual stockholders' meeting of The Excel Rubber Co., Wadsworth, Ohio, held November 2, Dr. F. W. Boyer was elected president; Z. N. Wallis, treasurer; and W. L. Good, secretary. The new directors elected include the above officers and the following: A. J. Krabill, W. M. Wells, F. G. Alderfer, H. D. Mench, and R. M. and E. H. Trump.

The Rubber Products Co., Barberton, Ohio, is working a night force in its druggists' sundries department to meet a largely increased demand, brought about by the approach of cold weather. The tire department, on the other hand, is operating at about 100 tires a day. The company has not seen fit to publish a statement regarding the business of the past year, submitted to the stockholders at the annual meeting. It is known, however, that while the balance sheet reflects the business conditions which have prevailed during the past twelve months, it is fairly satisfactory in view of these conditions.

E. A. Tinsman, formerly with The Portage Rubber Co., Akron, and latterly with the Standard Tire Co., Willoughby, has been elected president of The Salem Rubber Co., capitalized at $250,000, which will operate the plant of The Porter Rubber Co., Salem, Ohio. W. H. Sabol, Philadelphia, is vice-president; Joseph Schwab, president of the Philadelphia Tire Co., Philadelphia, is treasurer; and Grant Hill, Salem, formerly general manager of The Porter Rubber Co., is secretary. The Salem company is now producing 250 tires daily.

On account of the diversified line manufactured by the organization formerly known as the Marathon Tire & Rubber Co., the corporate name of the firm has been changed to the Marathon Company. The general offices and factory are at Cuyahoga Falls, Ohio, where tires, inner tubes, and belts for personal wear are made a specialty. R. D. Jenks is the secretary of the company.

The Hermann Tire Building Machine Co. announces that its offices have been moved from the Gugle Building to Room 310-12 Majestic Building, 63 South High street, Columbus, Ohio. W. H. Hermann is general manager.

E. H. Fitch, for more than 17 years connected with The B. F. Goodrich Co., has resigned to take over the management of the Republic Rubber Co., of Youngstown, which is at present in receivership. He was in charge of Diamond sales before the amalgamation with Goodrich, and subsequently has been in charge of Diamond sales for the consolidated company.

Rotary Tire & Rubber Company Reorganized

A plan for the reorganization of the Rotary Tire & Rubber Co., Zanesville, Ohio, is being worked out by the Studebaker-Wulff Rubber Co., whose temporary headquarters are at Room 204, 66 East Broad street, Columbus, Ohio. Under the new arrangements a large number of the principal creditors will take bonds, stock, notes, and some cash from the new company, while the Rotary stockholders are putting up new cash on a pro rata or quota basis, governed by their present holdings in the Rotary company. This idea appears to be meeting all requirements, and operations at the plant will undoubtedly soon be resumed.

The new factory building, which was erected for the Rotary Tire & Rubber Co. in 1919, is of brick and concrete construction, and comprises 32,400 square feet of floor space. It is equipped with the most modern machinery for tire making, and

has all the latest features which make for efficient production and ideal working conditions.

Associated with P. E. Studebaker, president of the new organization, and son of the well-known Henry Studebaker, are B. F. Wulff, former district manager in Chicago for the Kelly-Springfield Co., and later secretary and general manager of The International India Rubber Corporation, South Bend, Indiana, and Henry C. Buchanan, also formerly connected with the Kelly-Springfield Co. at Akron, as production superintendent.

Mason Acquires More Fabric Mills

The Mason Tire & Rubber Co., Kent, Ohio, has started an extensive program of operating cotton mills in the South and in conformity with this plan two mills have already been taken over and D. M. Mason, general manager, announces that other mills will be acquired as opportunities present themselves. The cotton mills in the South are being operated by the Western Reserve Cotton Mills Co., organized and financed by the Mason interests. An 11,000-spindle mill has been taken over at Quitman, Georgia, and a 6,000-spindle mill at Millen, Georgia. The total capacity of these mills will be 60,000 pounds of square-woven and cord builder fabric a week. While new fields are being entered by the Mason company the mills at Kent are operating at capacity and are producing 40,000 pounds of cord fabric a week. The original cotton mills company has been absorbed by the parent organization.

GOODYEAR PROGRESS REMARKABLE

E. G. Wilmer, one of the newest, youngest and yet dominant figures in the rubber industry, has made a definite impression upon the industry during the six months he has been at the helm of The Goodyear Tire & Rubber Co.

E. G. Wilmer

As an executive he has done for Goodyear what was predicted when he became its head. He has reduced inventories; he has reorganized the entire organization; he has produced $25,000,000 in cash, more than Goodyear ever had, and has kept the company in the forefront of production.

Mr. Wilmer's dealings with his executives are frank, open, quick and decisive. He leaves little doubt when an interview is completed or what can be expected. He makes decisions quickly but seemingly with unerring judgment. He is not often seen in Akron. He is generally at the factory office or somewhere in the factory, where he is accessible to the executives and men and women having dealings with the company, but the time limits are fixed and are rigidly adhered to. An interview to last five minutes lasts that long and no longer.

In his work of reorganization he has been as merciless as conditions required. The years of prosperity, the war, and the post-war period of wild extravagance and inflation had brought with them many extravagant and unprecedented policies. These had to be cut away regardless of length of tenure of office of the men in the departments. The entire organization had to be placed upon a new basis, and Mr. Wilmer unerringly found the weak places and rapidly made changes.

Gradually the new organization took form. Around George Stadelman, as sales head, and P. W. Litchfield, as production manager, the new and highly efficient Goodyear organization was whipped into line. Very shortly thereafter, the new order of the day began to show results. Orders were taken where it had appeared there were no orders. Production departments began making goods with what appeared to be skeleton organizations. But they made goods less expensive than the rubber world had seen since the early days of the industry.

Through it all, Mr. Wilmer remained quiet, reserved, but giving every evidence of potential strength. Today, with the company on a reorganized basis, there is no desire for applause. The machine is built and Mr. Wilmer is spending his time keeping it going and watching for minor improvements.

The new Goodyear, predicted when F. A. Seiberling saved the company from a receivership, is here, and the future is much brighter than many of the stockholders who have not seen the revamping of the organization can possibly dream.

PRESIDENT OF THE GRAND RAPIDS TIRE & RUBBER CORPORATION

L. A. Brown, who in 1920 organized and became president and general manager of The Grand Rapids Tire & Rubber Corporation, Grand Rapids, Michigan, is a native of the state mentioned, and was trained in its schools.

L. A. Brown

He began business as a salesman in 1898 with the Alabastine Co., of Grand Rapids, and travelled for this company through several states. Later becoming associated with the Continental Caoutchouc Co., Chelsea, Massachusetts, he was appointed in 1908 its western manager, and on the merging of that company with the United States Rubber Co., Mr. Brown was made district manager, with headquarters at Kansas City, Missouri.

In 1917 he resigned to become associated with The Mid-Continent Tire Manufacturing Co., Wichita, Kansas, as vice-president and general sales manager, and held these positions until he assumed his present connection.

A brief description of the new plant of The Grand Rapids Tire & Rubber Corporation, with a list of the company's officers, was given in the November issue of THE INDIA RUBBER WORLD.

The Rubber Trade in the Mid-West

Mid-West Rubber Manufacturers' Association

The regular monthly meeting of the Mid-West Rubber Manufacturers' Association was held November 8, at the Hotel Morrison, Chicago, Illinois. Only 12 regular members and a number of associate members were present, owing to the bad weather and the fact that the meeting was held on election day in Ohio.

The combined directors and executive committee meeting voted to recommend to all tire manufacturers the elimination of all mileage guarantees and that this resolution and copies of the "Standard Claim Form" adopted by the Tire Division of The Rubber Association of America be sent to all regular members.

The principal speaker of the meeting was H. C. Gardner, president of the Great Lakes St. Lawrence Tide Water Association, who gave an interesting talk on the deepening of the St. Lawrence river, and other important matters regarding the improvement of the river for navigation purposes.

Following Mr. Gardner's remarks each member present gave his views of the business outlook. The sentiment was unanimous that business is rapidly approaching normal and that better conditions will soon be realized in the rubber industry.

J. P. Matthews has resigned from the Association and Charles S. Sutherland will succeed him as secretary and general manager. The next meeting of the Association will be held December 13.

Miscellaneous Mid-Western Notes

Additions to the executive personnel of The McKone Tire & Rubber Co., 1943 McCormick Building, Chicago, Illinois, have been recently announced. These include the following: O. S. Tweedy, formerly connected with the Diamond Rubber Co., and later with the United States Tire Co., and C. Kenyon Co., general sales manager; J. F. Lanier, previously associated with the Diamond Rubber Co., the Norwalk Tire & Rubber Co., and later the Howe Rubber Corporation, distributer of McKone products throughout the South, where he is well known. The officers of The McKone Tire & Rubber Co. are: A. L. Gustin, president; C. W. McKone, vice-president; and L. C. Conley, secretary and treasurer. The company's plant is at Millersburg, Ohio.

Under the new name of Columbia Automotive Supply Co. the organization formerly known as the Columbia Tire & Supply Co. has removed from 427 Columbia street to larger and better quarters at 218 North Fifth street, LaFayette, Indiana. No changes, however, are made in the personnel of stockholders or management. The change of name was considered necessary in order to convey the information that the company carried all staple items used in the automotive field, instead of being limited to tires and tire supplies exclusively. W. S. Crowe is the sales manager of the organization and C. J. Mertz the purchasing agent.

W. H. Shell, a salesman with the Indianapolis, Indiana, branch of The Goodyear Tire & Rubber Co., has been awarded a 20-year service pin, the first to be given outside of Akron. Mr. Shell was one of Goodyear's earliest salesmen.

C. W. Holoker, with the Detroit, Michigan, branch of The Goodyear Tire & Rubber Co., has received a 15-year service pin.

L. W. Brummitt has recently organized the New Departure Tire & Rubber Co., Twelfth Street Terminal Buildings, Detroit, Michigan, to produce small-size cord tires at a popular price, backed by the company's guaranty as to quality. Mr. Brummitt is sole owner.

William N. Freeman has been recently appointed assistant sales manager of the Federal Division of The Fisk Rubber Co., Chicopee Falls, Massachusetts, and will have his headquarters at Cudahy, Wisconsin. Mr. Freeman has been for some time secretary of the company.

A readjustment of the financial affairs of The Wilson Rubber Co., Des Moines, Iowa, has resulted in the appointment of Walter Mauthe, as receiver, and the establishment, by the stockholders, of a reorganization committee. In the meantime, the manufacture is continued of one of the company's former products, a blowout patch, known as "SlaPatch," described in THE INDIA RUBBER WORLD, August 1, 1920.

The Kretchmer Manufacturing Co. has been succeeded by the A. I. Root Co., of Iowa, with address at 1028 Third street, Council Bluffs, Iowa. This organization, which specializes in bee-keepers' supplies, manufactures also beemen's rubber gloves. R. G. Calvert is president, and A. H. Dunn secretary and treasurer of this company.

It is announced that F. G. Bean has been appointed superintendent of The Blekre Tire & Rubber Co., Merriam Park Station, St. Paul, Minnesota. The company manufactures tires and tubes.

A new factory is being built for The Monticello Tire & Rubber Co., Monticello, Iowa, where preference in each department will be given to ex-service men. The company manufactures high-grade fabric and cord tires. J. S. Kelly, president and general manager of the organization, is also a member of the board of directors of the Hawkeye Tire & Rubber Co., Des Moines, Iowa.

The Mid-Continent Tire Manufacturing Co., Wichita, Kansas, has appointed Fred F. Golden sales manager, succeeding E. M. Tileston, who has taken over the sales of Midco cords on the Pacific Coast. Mr. Golden was formerly with The Goodyear Tire & Rubber Co., Akron, Ohio.

The Rubber Trade on the Pacific Coast

The Trade in Manufactured Goods

Dealings in mechanical goods generally were reported by most large agencies and jobbers as noticeably better than a year ago. Good building conditions all along the coast are an important factor, and the outlook for many more large factories, hotels, theatres, and apartment houses in the near future is said to be very promising, according to rubber dealers estimating on supplies.

Many of the moderate-cost apartment houses required by law to have coils of fire hose are dispensing with the cotton-rubber article and using a linen hose, which is preferred, not so much for cheapness, some say, as for compactness. It is the only non-rubber article handled by the coast branches of one of the biggest of the rubber corporations.

A livelier demand for suction and discharge hose following the resumption of oil field operations in Central California, where a strike had for weeks brought work almost to a standstill, and considerable inquiry from various industries for conveyor belting were much remarked in the rubber trade on the Pacific Coast during the month.

More sales of air hose to mining concerns are reported, implying a little later a revived demand for belting, boots and other rubber essentials in the backward mining industry.

Dealings in druggists' sundries have slowed down somewhat in many sections, druggists claiming that they are amply stocked over the holiday period, although admitting in many cases that they will be obliged to enter the market very early in 1922, if not in December, 1921. The impression has gained currency that there will be a marked shading of prices before long by the manufacturers, but no one appears to have definite information to that effect. Retail dealers at any rate are eager to get rid of high inventory goods at holiday prices before many new commitments.

Tire and tube sales are holding up very well in the coast territory, replacements being numerous on account of the all-year general use of automobiles, especially in the southern section, and a large influx of cars from all parts of the country. The various tire making concerns report an easing up in production, but their advices are that dealers' stocks are quite low and that they will be soon in the market for more goods.

Several concerns have been lately studying foreign markets and are confident of getting and retaining a good-sized trans-Pacific trade as soon as exchange becomes normal. Tire producers, in speaking of foreign trade prospects, declare that they have a freight rate advantage of about $2 a casing, as compared with the cost of casings shipped to the Coast from the East and Mid-West, and that other economies they can effect in manufacture would enable them to quote Pacific export prices of from $4 to $5 a tire cheaper than rivals in the sections named. So, too, are they confident that in the Far East they can readily meet European competition. Shipping service has markedly improved in recent months.

San Francisco

The India Tire & Rubber Co., Akron, Ohio, has opened a warehouse branch at 455 Second street, San Francisco, under the name of the India Tire & Rubber Co. of California. San Fran-

cisco is the third city in which the India company has established warehouses within the last four months; a distributing branch having been recently opened in Dallas, Texas, followed by another in Minneapolis. The manager of the San Francisco branch, F. L. Ryan, has had much experience and many friends in the rubber industry in the West. He was at one time manager of the Sacramento branch of The B. F. Goodrich Co., and later sales manager of this company's Los Angeles branch. Relfe Wingo, formerly associated with the Federal Rubber Co., has also joined the sales forces of the India company, and will call on the trade in Southern California.

The Nash-Kohlmoos Rubber Co., San Francisco, California, has been appointed a distributer of "Savage Cord" tires by The Spreckels "Savage" Tire Co., San Diego, in the same state. It will cover Kings and Tulare Counties.

Martin, Hoyt & Milne, Merchants Exchange building, San Francisco, California, with branch offices in Los Angeles, Portland, Seattle, and Vancouver, have been appointed sales agents on the Pacific Coast for the States Metals Co., Inc., 30 Church street, New York. Local stocks of sulphuret of antimony, magnesia, etc., will be carried.

Rubber Club of San Francisco Organized

Recognizing the lack of unity and with a view to promoting local interests certain men prominent in the California industry have formed the Rubber Club of San Francisco. Membership is confined to managing heads, or executives of factory branches and direct factory distributers of rubber companies. Also, membership is vested in the individual member and not at all in the firm he represents.

The organization includes heads or executives of practically all the tire companies operating in San Francisco. The officers are: J. B. Brady, general manager, Pacific Coast Division, United States Rubber Co., president; F. H. Lyon, vice-president, Chanslor & Lyon Co., vice-president; C. W. Jackson, branch manager, The Miller Rubber Co. of California, secretary and treasurer. In addition to these officers, the executive committee consists of: Frank E. Carroll, district manager, Goodyear Tire & Rubber Co., and George S. Towne, vice-president, Pioneer Rubber Mills. The office of the secretary is at 21 Van Ness avenue, The Miller Rubber Co.'s San Francisco factory branch.

Los Angeles

Plans for the proposed factory of the Imperial Cotton Mills Co., first mentioned several months ago in THE INDIA RUBBER WORLD, are nearly complete. The plant, using 10,000 spindles and employing 300 persons, will be located in Los Angeles and will cost, it is said, nearly $1,000,000, the financing being done by local capitalists and wholesale textile goods men, as well as some Boston cotton manufacturers. It will be the third concern on the Pacific Coast to manufacture tire duck and other cotton weaves used in the rubber industry, the other concerns being the Goodyear Textile Mills in Los Angeles and the California Mills at Oakland.

Recent figures give an annual cotton textile consumption in the Coast states of 50,000 yards of 4 to 6-yard sheetings, 15,000,000 yards of 6 to 12-ounce duck, 5,000,000 yards of 2-50 drills, 15,000,000 yards of 2-20 denims, 2,000,000 yards of osnaburgs. Cotton from Southern California and Arizona will be largely used, but in coarse goods it is likely, it is said, much eastern cotton will also be utilized. Not the least important of the new company's prospects is a large trade with the Orient, where it is sanguine it can hold its own with the British and others.

With stock offered only to owners of automobiles, who will be entitled to a 40 per cent discount on all tires and tubes manufactured by the concern, the Pacific Coast Tire & Rubber Manufacturing Co. is planning to finance the building and equipping of a plant with a capacity of 500 tires and 1,000 tubes a day. A 20-acre site has been bought in Burbank, a suburb of Los Angeles, on the Southern Pacific Railroad. The company's capital is $2,000,000, a large amount having already been subscribed. The concern will feature two treads, "Grizzly Bear" and "Mission Bell." Sizes will range up to 35 by 5 in cords and fabrics. R. M. Starrett is manager, and the company's office is at 1139 Merchants' National Bank building, Los Angeles.

Manager J. B. Magee, of the Los Angeles branch of the United States Rubber Co., has been inspecting the field in and around San Diego, and latterly conferring with the company's representatives in northern California. He reports trade generally as comparing well with a year ago and gradually increasing. Tire sales since October 1, he states, are even better than a year ago, and while the demand for tubes is strong it is hard to get them. Rubber shoes and miscellaneous rubber goods are selling exceptionally well.

The largest shipment of cotton to an eastern port was lately cleared through Los Angeles harbor, when the United American liner "Alaskan" sailed with 1,000 tons of Sarival (Arizona) cotton consigned to a Boston tire concern.

Fully 150 students have graduated from the free tire repair school of the Goodyear Tire & Rubber Co., of California, Los Angeles, since its inception a year ago and nearly all have good jobs. Among the learners have been the owners of some of the largest vulcanizing concerns in Southern California, according to George Irwin, chief instructor.

Harry E. Blythe, manager of the Goodyear personnel department, has come to the Los Angeles, California, plant temporarily to succeed C. C. Slusser, as general manager. The company announced that Mr. Blythe will be at the Los Angeles plant for five months while Mr. Slusser will work with P. W. Litchfield in Akron, completing some staff work. A. F. Pond has also come to Los Angeles to succeed R. P. Dinsmore, resigned.

The distribution of Horse Shoe tires in Mexico is now conducted entirely through the Los Angeles office of the Pacific Rubber Co., according to Roy R. Meads, president of the company. Until recently the company's sales in the southern republic were confined to the cities on the west coast. It has since been decided by the factory to cease sending tires to Mexico via Texas and to make all deliveries through the Southern California metropolis.

The Bland stage line operating between El Centro and Holtville, California, over what is considered one of the hardest roads in Imperial Valley, has equipped all its cars with cord tires made by The Spreckels "Savage" Tire Co., San Diego, California.

Horace H. Huntington

One of the first rubber men in the Southwest to take up the repairing of giant pneumatic tires and rubber footwear was Horace H. Huntington, head of the Huntington Rubber Co., 112 East Eighth street, Los Angeles. Mr. Huntington is a native of Ottawa, Canada, and has been in the automobile tire business fifteen years. Beginning in a very modest way, he has through hard work and enterprise built up one of the largest sales agencies and repair plants in the city, featuring Samson, Michelin, and Miller pneumatics and Mason solids. He is aided by his son, Henry C. Huntington, and fifteen employes. For handling solid tires the concern has installed a 300-ton hydraulic press, and added several up-to-date devices for general retreading, sectional repair work, etc., besides improving its rubber shoe repairing plant.

The Rubber Trade in Great Britain

By Our Regular Correspondent

Committee to Report on Rubber Situation

MR. CHURCHILL, Secretary of State for the Colonies, has appointed the following committee to investigate and report upon the present rubber situation in British Colonies and Protectorates and to advise what remedial measures should be taken to improve the existing situation: Sir James Stevenson, commercial adviser to the Colonial Secretary, chairman; G. E. A. Grindle, Colonial Office; Sir Stanley Bois, chairman of the Rubber Growers' Association; Sir Edward Brockman, Malay States Agency; E. J. Byrne, Dunlop Rubber Co., Limited; William Duncan, Straits Rubber Co., Limited; Eric Miller, Harrisons & Crosfield Co., Limited; Sir Edward Rosling, Anglo-Ceylon & General Estates Co., Limited; S. H. Leake, Colonial Office, secretary.

Presumably this committee is a sop to those members of Parliament who have been somewhat insistent on something being done by the Government, though it is difficult to see how it can be more successful in finding a panacea for the present condition of affairs than those who have already given close and earnest attention to the matter.

Rubber Competition Awards

It seems to be the general feeling that the handsome monetary prizes offered by the Rubber Growers' Association for suggestions for new uses of rubber have been somewhat easily earned by the recipients and that as far as an impetus to trade is concerned the suggestions are of little importance. It would seem that a new use for consuming rubber on a scale somewhat like that of the tire industry has yet to be discovered. Still the competition has set many people to thinking and among those who are interested in raw rubber there is a stern resolve to be up and doing. It rather looks as if in the near future the old established rubber manufacturer will begin to groan under the weight of advice freely tendered to him and will be disposed to cry in alarm, "Save me from my friends." What with the Rubber Growers' Association, the Rubber Shareholders' Association, and the new Institution of Rubber Industry, all on the warpath, the flow of suggestions may easily become bewildering.

Rubber Goods Are Not All Rubber

With regard to rubber goods the public does not seem to have sufficiently grasped the fact that many rubber goods are not composed entirely or even largely of rubber and are never likely to be, or that an increased output of say 100 tons of certain rubber goods may not use up more than 30 or 40 tons of rubber. While the potential advantages of increasing the amount of pure rubber in all sorts of rubber goods are being loudly proclaimed, it hardly seems diplomatic for the rubber reclaimers to sit with folded arms, but of course they may argue that they do their business with the astute rubber manufacturer and that they have no proof that the latter is hurriedly changing his established formulas.

Although the use of rubber pavement and tiling is advancing and many of our important rubber works are engaged in its manufacture, constant efforts are being made to reduce the percentage of rubber. Thus a Preston company has patented a vulcanized rubber flooring material containing about 60 per cent of wood meal. While on this topic I may mention that the Wood-Milne Co., Limited—which is, of course, now combined with Spencer-Moulton's—has ceased making tires at Leyland and is having them all made at Spencer-Moulton's works at Bradford-on-Avon. Rubber heels and tiling are now the principal articles made at Leyland.

The Rubber Shareholders' Factory

Reverting to the Rubber Shareholders' Association again, the idea of starting a rubber manufacturing business seems to have taken a strong hold, and the provision of a capital of £500,000 by a percentage tax on the members is being seriously considered. I do not see how a multiplication of factories can necessarily be taken as indicating the use of more rubber unless it can be shown that existing works are being utilized to their full capacity. All the evidence rather points to the contrary and it is the difficulty of obtaining orders which is paramount.

Labor Troubles Again

The proposal of the employes that the working week of members of the Amalgamated Society of India Rubber Cable and Asbestos Workers shall be advanced from 47 to 52½ hours a week is being strongly resisted, unless wages are raised. This, the manufacturers are not prepared to do. Indeed they propose a reduction of 7½ per cent. The workmen's offer is a reduction of 5 per cent for a 47-hour week, and at a mass meeting in Manchester they instructed their officials to insist on this or to call a strike. The Ministry of Labor has been approached by the men and a special meeting of the India Rubber Manufacturers' Association has been called. It is stated on the men's behalf that the highest paid workers receive about £4.10.0 per week, but the average is under £2.15.0. The hopeful aspect of the situation is that the tendency to strike at short notice, as prevalent in most branches of labor a year ago, is not now as noticeable and this is emphasized in the latest information to hand, namely, the following resolution passed by the workers' union: "That we have carefully considered the whole of the position and we ask the employers to call a further conference for the purpose of trying to find means whereby this dispute could be amicably settled."

The Late John B. Dunlop

The passing of this pioneer of a most important branch of the rubber industry cannot be passed over in silence, though the story of his discovery is so well known that it needs no lengthy reference. Although, of course, he derived a certain income from his invention, yet its development was entirely in the hands of the Du Cros and he cannot be considered a rubber man any more than was the late Earl of Shrewsbury and Talbot.

Institution of Rubber Industry

The inaugural meeting held in London on October 19 must be considered as eminently satisfactory, both from the point of view of attendance, about 200 being present, and sustained interest in the papers and discussions. The space available in this correspondence does not permit of more than a brief reference to the agenda, which comprised the presidential address by J. H. C. Brooking, of the St. Helen's Cable & Rubber Co., Limited, a speech by Sir Henry Wickham on the "Hard Cure," and a paper on "India Rubber Manufacture," by Herbert Rogers, of James Lyne Hancock, Limited.

Mr. Brooking made some trenchant and opportune remarks on the commercial side of the industry. A peculiarity of rubber manufacturing, he said, is the scope it gives to the imitation of properly manufactured articles in a way which cannot easily be distinguished by appearance, thereby lessening the total demand for these articles when the defects of the imitation become known. He went on to speak of the inherent difficulties associated with the manufacture, and expressed the opinion that no manufacturer

made perfect goods always. The main reason for this he attributed to the variability in the selling price of the goods. Cutting prices meant cutting quality and the sooner this was understood and got away from the better for the rubber industry. If only prices could be kept stable at a reasonable profit then competition could be based on the quality of the manufactured article, which was the best kind of competition after all.

This ideal of his, Mr. Brooking stated, had not met with support from other manufacturers though it was clear that America, with its standard specifications for so many classes of rubber goods, recognized its importance. The new institution, he thought, might prove of material help to the industry in this and other directions if the manufacturers were far seeing and broad minded enough to accept the gospel of mutual help and trustfulness that was one of the bases of such technical institutions.

The first Manchester meeting is to be held on November 7 with Sir Charles Mandleberg in the chair.

The Proofing Branch

There has been quite a spurt of business in the proofing factories and it is surprising to learn of some of them working not only a full week but overtime as well. This may not be general, as so much depends on the class of goods being proofed and the smartness of the proofers in securing the still limited amount of business. The wonderfully fine autumn has, of course, prevented the rapid sale of the large stocks of raincoats and rubbered fabrics which the warehouses have put upon the market. Some of these are not quite the bargains that they appear to be at sight, because not only is the fabric inferior but the making up as regards waterproof seams leave much to be desired. The purchaser, of say a rubber-lined raincoat at 21 shillings, does not see why he should pay 35 shillings for an article which has a very similar appearance. But if he knew more about the composition and make-up of the garment he would find that it was really more economical to buy the higher priced coat.

I have been examining some good-quality, light, double-texture coats for the Indian market. In the case of good-quality coats the double-texture is the rule because a rubber surface is soon affected by the heat of the sun. The business runs on much the same lines as in England, the well-to-do people buy the good qualities while there is also a large demand among the natives of the middle classes for a cheap macintosh, the black surface being popular. It has to be remembered that over a large part of the country it rains for three or four months, though despite this there seems to be no demand for goloshes. Some of the big textile firms which are represented in India send their clothes to proofers of piece goods to be proofed and have their own making-up factories from whence the goods are despatched to India. Prices for proofing continue on the down grade, the firms in the association having issued new lists with a view of stimulating business. No doubt those firms outside the association will also follow suit.

The Commercial Motor Show

Although not the novelty they were a year ago, the giant tires shown by the Goodyear and Dunlop companies were a most prominent feature. Among novelties was the "Gable" cushion tire, shown by Chas. Macintosh & Co., Limited. This is for vehicles up to five tons carrying capacity. Having a castellated tread, under heavy loads the bearing surfaces tend to increase the air chamber, making an effective cushion. With this type of tire distances of about 30,000 miles are easily attained on some types of omnibuses. The N. A. P.—normal air pressure—were also on view. These are made especially for disk wheels used in high mechanical transport, notably the rear axle of Ford one-ton trucks. Some of the features are that they do not require a spare wheel or tire; they give the maximum resistance to the abrasive action of the road and they are perfect non-skids. A prominent point in their manufacture is the central confined air core with specially strengthened shock-absorbing walls.

The Michelin Tyre Co., Limited, displayed a set of pneumatic tires for buses, lorries, etc., with twin rear and single front to carry about 8½ tons. With regard to finance the opinion is generally held that the London shows have not done the share market any good and are not likely to until the majority of these companies raise their courage up to the pitch of adjusting their capital accounts to a level corresponding to their market value.

Captain Buckleton Resigns

Captain Ernest E. Buckleton has resigned from his long and active connection with the North Western Rubber Co., Limited, of Litherland, Liverpool. He and Alexander Nourry, of the same company, have started business at 13 Rumford street, Liverpool, as dealers in raw and reclaimed rubber. Presumably they will supply reclaimed of other than North Western make.

RUBBER PAVING BLOCKS

There is being shown at the present time in the windows of the Malay States Government Agency in Cannon street, London, England, a specimen rubber paving block manufactured in the Federated Malay States under the Caulfield patent system. The block is composed of a rubber cap from one-half to three-quarters of an inch in thickness, secured under pressure to a concrete block by a continuous band of expanded metal. The concrete block measures 9 by 4 inches and varies in depth from 3 to 6 inches, according to local traffic conditions. Blocks are laid down upon a concrete foundation after the manner prescribed for wood block paving.

Several advantages over other paving systems are claimed by the manufacturers of this product. One is that the adhesion between the rubber and concrete is secured under pressure, which is not the case in systems previously attempted. Other claims are that these blocks can replace an existing wood-block pavement, and that the system, when adopted, gives a non-slipping, practically noiseless road surface.

The blocks are designed by R. St. George Caulfield, executive engineer, Public Works Department, Federated Malay States. At present prices they can be manufactured at 45 cents each (12.6*d.*), equal to about £1 7*s.* 6*d.* per square yard.

The Rubber Trade in Europe

By Our Regular Correspondent

France

The Compagnie Française des Câbles Télégraphiques reports profits of 10,991,149 francs for the past business year against 6,596,788 francs the year before. The dividend was fixed at 42.71 francs a share of the first series and at 8.08 francs for those of the second series. At the formation of the Radio-France, the company subscribed for 12 million francs, which is one-fifth of the capital.

A visit to the factories of A. Olier, Clermont-Ferrand, by member of the staff of *Le Caoutchouc et la Gutta-Percha*, discloses interesting projects of this firm. Patents are about to be taken out that will, it is claimed, completely revolutionize the manufacture of pneumatic and solid tires. This firm is at present concentrating on the problem, which seems to be on the minds of all manufacturers at present, of transforming fabric tires into cord tires. At the Etablissements A. Olier this transformation is now accomplished. The company has just patented a machine for making carcasses by which the manufacture of bicycle tire covers has been completely changed. This machine and the vulcanizing and forming press covered by a former patent, constitute a combination for the automatic manufacture of pneumatic cord tires.

Russia

At a meeting of the "Prowodnik" held at Riga, May 26, the board of inspection was authorized to put the factories of Riga in working condition. The capital will be increased to 75 million

francs, and, according to *L'Information*, the first five million new shares will be issued, before the end of the year. A small factory at Riga which is at present closed but has its equipment practically intact, will be purchased.

Due to the depreciation of the ruble, 250 francs will be the nominal value of the new shares and of the old ones. Shareholders who were prevented by the war from participating in the issues of 1917, will have prior rights in the first issue. Furthermore, the dividends for 1913, 1914 and 1915 will be paid to the French shareholders who were unable to cash their coupons in due time. The value of these coupons will be 8.30 francs, the three coupons therefore representing 24.80 francs. It will be remembered that the dividend coupon for 1916 (12 rubles) was never disturbed and was declared not valid in consequence of the events of 1917.

Germany

On September 23, the German Automobile Exhibition was opened in Berlin and has been declared most successful. The last exhibition was held here ten years ago and the present show demonstrates the great strides that have been made since in the automobile industry and, incidentally, in the tire industry.

All the important tire manufacturing concerns were represented and exhibited their best and newest products. The Continental Caoutchouc Gutta Percha Company, Hanover, has placed two new tires on the market, the Continental cord tire and the Continental giant pneumatic cord tire, with straight sides. These appear to be the first cord tires made in Germany, and found a place of honor at the exhibition. It seems that during 1913-14 plans for the above improvements were under discussion, but proceedings were interrupted by the war.

The only other company that at present makes cord tires in Germany is the Hannoversche Gummiwerke "Excelsior," A.-G., Hanover, who also exhibited a giant pneumatic, Excelsior solid and concave tires, and tires with non-skid treads.

The firm Witzel's Patent-Brückenreifen G. m. b. H., Ludwigshafen, had a new hollow automobile tire on view. Instead of a tube, there were shaped rubber ribs arranged in the inside of the tire. The Rauhgummigesellschaft A.-G., Berlin, exhibited its specialty, treads and solid tires with raw rubber vulcanized on the outside. The firm of M. & W. Polack, manufacturer of special fabric for all-rubber tires, Merseburg, showed its Dominator solid tires. This concern claims to be the first to manufacture solid tires in Germany; it is also the only firm that devotes itself to solid tires exclusively.

Other exhibitors were: Metzeler & Co., Munich; Schmidt's Gummiwarenfabrik, Stade, Hanover; Duela-Reifen-Gesellschaft, Brandt, Frattini & Co., Berlin; B. Polack, A.-G., Waltershausen; Mitteldeutsche Gummiwarenfabrik, Louis Peter A.-G., Frankfort-on-the-Main; Asbest-und Gummiwerke Alfred Calmon A.-G., Hamburg, and several other leading firms.

The amount of attention and discussion which the cord tires, giant pneumatics and non-skin tread designs came in for might have seemed astonishing to Americans to whom the above developments are already old. While other countries, particularly America, were able to improve their rubber tires during the war, Germans were desperately attempting to make substitutes, and it now becomes evident how hard they must have worked to achieve what has been shown at the exhibition.

Germany's Rubber Trade in 1920

An annual statement of Germany's foreign trade for 1920 is interesting from the fact that it is the first annual statement published by the Federal Statistical Bureau of the German Ministry of Economics since the year 1913. That the balance of trade is in Germany's favor is evidenced by the fact that German exports for 1920 amounted to 198,096,079 double centners valued 69,524,476,100 paper marks (the double centner equals 220.46 pounds), while imports amounted to 188,366,261 double centners. These figures do not include reparations deliveries under the terms of the Treaty of Versailles. The imports of rubber goods were 20,611 double centners, while the exports totaled 31,132 double centners, valued 295,827,000 paper marks.

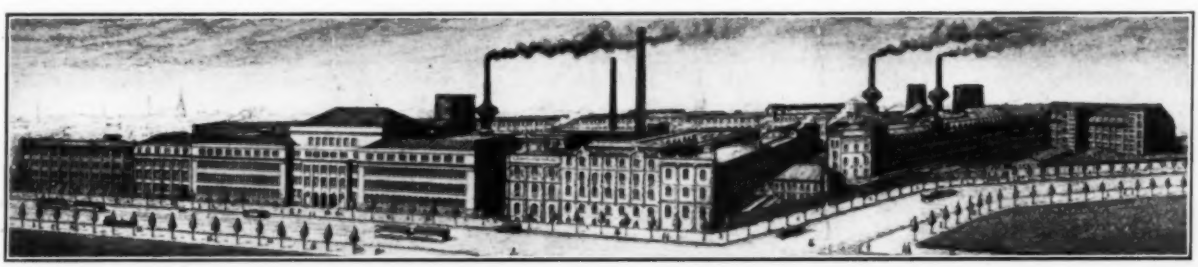
French Goods in the Occupied Territories

Although British, Americans and Belgians are endeavoring to capture the local markets for rubber goods, the French are employing propaganda that is particularly dangerous to the trade in German articles. Well-written articles and profusely illustrated advertisements of French rubber articles appear in the Rheinland newspapers, and in all places of amusement, societies and clubs. Another method is through inquiry for an article of French make and if the dealer does not stock it, the customer gives the firms' names from whom it can be obtained. When this occurs repeatedly, the dealer naturally finds himself forced to stock the goods.

The correspondent of the *Gummi-Zeitung* advises that in the face of this competition, German manufacturers should not concentrate on these territories, but should give their best efforts to the interior.

The Continental's Anniversary

The Continental Caouthchouc & Gutta Percha Company, Hanover, has just celebrated its fiftieth anniversary. This premier German rubber concern, and one of the leading rubber firms of the world, rose to its present position from a very modest beginning. In the sixties, there stood on the site of the present works, a small factory that made rubber combs. It got into money difficulties and was bought up by the banker Magnus, who, in combination with some financiers and rubber men, in 1871 formed a stock company with a capital of 900,000 marks.



Continental Caoutchouc & Gutta Percha Co., Hanover, Germany

It was not until 1873 that the factory, which was rebuilt and expanded, began the manufacture of playing balls, tubes, horseshoe pads and rubber packing. The year 1874 closed with a loss of almost 30,000 marks, but 1875 saw a small profit.

In 1876 the banking house of Magnus, who was most interested in the business, sent Sigmund Seligmann, then in their employ, to take the leadership of the Continental. It is chiefly due to this Nestor of the German rubber industry and the chemist,

Adolph Prinzhorn, that the Continental has developed successfully. Today it has 20 branches in Germany and before the war many in foreign countries, besides factories in Paris and Melbourne. In 1893 the Continental works employed 600 persons, today there are over 12,000.

The original capital of 900,000 marks in 1871 grew to 12,000,000 marks in 1912; in 1920 it was increased to 54,600,000 marks and at a meeting on the 7th of October it was decided to raise this capital to 67,500,000 marks. The firm possesses 16 houses, a coal-mine, a harbor, ships and the like. To commemorate the anniversary endowments totaling 10,000,000 marks were made. Mr. Seligmann was given the honorary degree of Doctor-Engineer by the Technical University of Hanover.

German Notes

The Price Convention of German Surgical Hard and Soft Rubber Factories, Leipzig-Vo., announces that until further notice prices will be 15 per cent higher. Special emphasis is laid on the terms whereby goods received after October 1 are not to be sent to foreign countries. Persons wishing to make deliveries abroad must obtain the special regulations from the convention.

Manufacturers of all kinds of rubberized fabrics raised their prices a little while ago and have now been forced to increase them again.

It is reported that an increase in the prices of tires for automobiles, motorcycles, bicycles, trucks and also for other vehicles is imminent. The new prices will probably be 20 per cent higher.

Asbestos goods, including asbestos and rubber goods, have been raised 20 per cent. The new prices are to be effective immediately.

The Hosenträgerfabrik Paul Karstedt, Berlin N 58, has patented a new material for suspenders, garters and belts. This consists of a layer of webbing which is combined with a layer of rubber by vulcanization. The webbing prevents perspiration from reaching the rubber and adds durability.

The Hackethal-Draht-und Kabelwerke Akt.-Ges., Hanover, has decided to double its capital which will now be 68 million marks. The management reports that business is extraordinarily active and that results of the year are of a nature to please shareholders.

The Nienburger Eisengiesserei und Maschinenfabrik, Nienburg, has installed new equipment in a department for the construction of rubber machinery. The firm plans to extend the works and has already purchased an adjoining building for the purpose.

New German Rubber Firms

Kabelwerk Rhenania, G. m. b. H., Brand near Aachen; manufacture of insulated wires and cables, rubber goods and allied articles.

Firma Heinrich Eckert, Chemnitz; representation and sale of rubber and asbestos goods, belting, packing and the like.

Gundi-Gummi-Gesellschaft m. b. H., Hanover; this company will continue the business formerly carried on in open partnership by Blumenberg & Powitzer, Hanover.

Rheinische Gummisohlenfabrik G. m. b. H., Düsseldorf-Oberkassel; rubber soling and repairs.

"Arco" G. m. b. H., Düsseldorf; sale of technical goods and representation.

Firma Kurt Korioth, Finsterwalde (N. L.); manufacture of rubber goods.

Mineralöl-Grosshandels-Gesellschaft m. b. H., Wiesbaden; trade in oils, fats, technical goods, rubber goods.

Asbest und Gummi W. Richard Putze, Berlin.

Chemische Produkte und Gummifabrik A.-G. Berlin-Steglitz, Berlin Steglitz; manufacture and sale of chemical, pharmaceutical products and of rubber goods; capital, 3,000,000 marks.

Gummi-Fabriks-Aktiengesellschaft Viktoria, Brünn.

H. Eppler & Co., Stuttgart; trade in "Fuga" rubber goods and other novelties.

Westdeutsche Draht- und Kabelwerke Aktiengesellschaft, Duisburg; manufacturer of all kinds of insulated wires, cables, conductors, and the like; capital, 6,000,000 marks.

The B. Polack Aktiengesellschaft, Waltershausen (Thür), has established a selling branch for the occupied Rheinland and Siegerland at Köln-Lindenthal. Solid tires, bicycle tires, technical rubber goods are among the articles that will be stocked here to facilitate dealings with the firm's customers in the occupied territories.

Gummi- und Maschinenfabrik Heinrich Schneider, Frankfort-on-the-Main.

Carl Senf Gummiwaren-Fabrik, Leipzig-Schleussig; manufacture of rubber goods.

Firma Heh. Wohlfahrt & Co., Ludwigshafen-on-Rhine; manufacture of rubber and metal stamps.

Süddeutsche Technische Vertriebszentrale, G. m. b. H., Munich; sale of all kinds of technical goods.

Treibriemengesellschaft m. b. H., Stettin; manufacture and sale of belting and other technical goods.

Sweden

The Fränsta Regnkläders fabrik, Persson & Wikström, Fränsta, Sweden, has been established to deal in raincoats.

The A.-B. Landskrona Gummifabrik, Landskrona, Sweden, has been declared insolvent. This concern was formed in 1918 with a capital of 500,000 kroner.

R. & J. Dicks Agentur, Axel S. Stangenberg, Stockholm, is a new branch of the well-known English belting concern, R. & J. Dick, Limited.

The newly established Amerikanska Gummi-Importen "Fenix," Carl Grantell, Karlstad, will import rubber goods.

Denmark

The A.-S. Dansk Afoulkaniseringsfabrik, Kjögge, has built an addition to its factory for the purpose of expanding the manufacture of automobile tires.

At Copenhagen, a new firm dealing in raincoats has been established, namely, The British Raincoat Depot (Britisk-Regnfrakke-Depot), Josef Rönn.

Rubber soles and heels of the "Skandinav" brand are now being manufactured by the Skandinavisk Gummifabrik Leo Schwanenflügel, Söborg near Copenhagen.

The Narsk Import Co. A.-S. (Nico), Copenhagen, is the Scandinavian representative for Peters Union pneumatic tires, the product of the Mitteldeutsche Gummiwarenfabrik, Louis Peter A.-G., Frankfort-on-the-Main, Germany.

FOREIGN TARIFFS

Czechoslovakia

By a decree of August 26, 1921, effective October 1, 1921, the Czecho-Slovak Foreign Trade Office has removed restrictions on the exportation of the principal Czecho-Slovak products. This decree includes also articles of necessarily foreign origin, which may be reexported. Among these classified products rubber, gutta percha and manufactures thereof are mentioned. All such unrestricted articles may be exported without any special license or permit, although a notification of the export, with a statement of its value, must be submitted by the sender to the Foreign Trade Office. For the importation and exportation of certain goods not mentioned in the classifications special licenses are still necessary.

France

Recent decisions regarding the classification of certain commodities under the French customs tariff include among other articles duties on embroideries made on rubberized fabric. According to the new rulings the duty on such fabrics is increased by the surtax for embroidery.

Germany

A proclamation, dated September 30, has been issued in connection with entry permits requirements, previously required for the importation of goods from the occupied territory into unoccupied Germany. Such permits will be no longer necessary for the following articles:

Tariff No.	Articles
708	Klingerite, boiler coatings, packing sheets and rings and other unspecified wares of asbestos, asbestos paper, rubbered asbestos tissues, gloves, clothing, masks, caps, tubes, shoes of asbestos tissue; all these combined or not with other materials.

Hungary

Among the list of goods which, according to a compilation of the Hungarian Foreign Trade Office, dated August 31, may be imported into Hungary without license are the following:

304-308	India rubber, gutta percha and balata, including waste: india rubber solution, threads, paste, sheets.
ex 311	Boots and shoes of rubber, even combined with textile or other materials, except rubber heels.
315-7	Woven and knitted materials covered or impregnated with rubber; elastic materials, woven and knitted: clothing and other made-up goods made of such materials.
ex 320	Articles for technical purposes, except tubing, tyres, fittings of hard india rubber, and press-cloths.
ex 388	Mirrors, mounted with rubber, leather, or with non-nickeled parts of iron or common metals.

Common resin, shellac, gum arabic and caoutchouc oil are among the commodities also on this free list.

Rumania

A number of articles, divided into two classes, upon which certain "luxury" taxes are levied, may be imported into Rumania on payment of the customs duties, plus the "luxury" tax, which as a rule is equal to the customs duty proper. Among the articles listed were the following; under tariff No. 1394: Artificial flowers and parts thereof, of paper, porcelain, glass, celluloid, india rubber, etc.

Sweden

Following a Royal Decree dated September 26, the prohibition on the exportation from Sweden of certain articles has been withdrawn. The prohibition, which became effective October 1, includes among other commodities the following, under customs tariff number ex 1098: vehicles (other than motor cars, airships and airplanes) provided with rubber tires; also frames and wheels with rubber tires.

Switzerland

Among the articles whose importation is restricted under the Swiss decrees of July 15 and July 19, 1921, said decrees having become effective July 25, 1921, are the following: (item 527) elastic fabrics of all kinds; (ex-items 557-559) suspenders, garters, stocking supporters, belts, all made of elastic fabric.

East Africa

Among changes made in the customs tariffs of various East African dependencies is one made by the Governor of Tanganyika Territory, a modification which became effective August 9. Under the new schedule it is noted that among other items rubber (other than plantation rubber) has an export duty of 4 per cent ad valorem.

EGYPTIAN PIRELLI COMPANY FORMED

Press reports state that the Sultan of Egypt has signed a decree authorizing a new limited company under the name of Societa Egiziana Prodotti Pirelli. This is an Italian firm, with headquarters at Milan. The directors are Dr. Piero Pirelli and Dr. Alberto Pirelli, both of Milan. They will be represented by Commander Ugo Cavallero of Milan, Camillo Viterbo, Rurio Lucuo and Roberto Auritano, all of Alexandria.

The new company has a capital of 60,000 pounds, Egyptian, divided into 3,000 shares of 20 pounds, Egyptian. The firm will manufacture and sell Pirelli products such as manufactured rubber goods, elastic cables and accessories, and all sorts of cotton products employed in their manufacture.

SWITZERLAND'S RUBBER TRADE

The manufacture of rubber goods in Switzerland, while not carried forward on a large scale, is nevertheless of importance. The chief products are seamless goods, ice bags, baby pacifiers, nipples, solid tires and garden hose. There was considerable production during the war. Following are the official statistics of Switzerland's rubber imports and exports for 1913, 1919 and 1920:

Rubber, unmanufactured, including waste rubber	1913		1919		1920	
	Imports	Exports	Imports	Exports	Imports	Exports
Africa	$66,392	.....	$141,908	.....	$74,045	.....
British India	84,592	.....	171,950	.....	19,112	.....
Germany	13,166	$20,034	41	$14,036	1,692	$21,944
France	4,481	16,793	47,654	8,583	4,334	1,964
Brazil	37,195	.....	231,667	.....	41,168	.....
Belgium	.....	6,840	.....	.....	.....	.....
England	.....	.....	.....	.....	11,974	1,619
United States	.....	3,190	.....	.....	.....	.....
All others	10,750	4,068	25,177	.....	3,202	5,913
Totals	216,576	50,925	618,397	22,613	155,527	31,440
Rubber rings, strips, bands, balls, and automobile and bicycle solid tires						
Germany	$395,042	$2,491	$26,012	$2,598	$132,756	$2,992
France	26,707	3,536	586,605	4,457	413,183	11,370
Italy	19,056	18,835	93,649	843	90,013	5,928
England	33,107	146	201,352	3,447	295,337	12,195
United States	.....	.....	59,580	.....	.....	.....
All others	16,423	5,183	1,134	19,120	35,924	62,629
Totals	491,235	30,191	968,332	30,465	967,213	95,114
Pneumatic tires for bicycles and automobiles						
Germany	711,873	3,179	45,231	1,746	304,419	1,903
France	175,398	9,337	1,261,188	1,051	1,212,597	1,696
Italy	65,187	5,535	386,599	.....	130,534	.....
England	21,307	136	297,267	.....	415,312	1,640
Russia	46,204	234	.....	132	.....	.....
United States	2,226	.....	131,292	.....	436,015	.....
All others	17,930	6,521	12,528	5,934	103,372	12,211
Totals	1,039,325	24,942	2,134,105	8,863	2,602,249	17,450
Rubber threads for elastic weaving						
Germany	16,677	.....	4,246	.....	151	.....
France	328	.....	29,253	.....	13,714	.....
England	36,091	.....	43,894	.....	52,804	.....
United States	15,748	.....	46,967	.....	.....	.....
All others	1,969	.....	9,986	.....	6,873	.....
Totals	70,213	.....	134,346	.....	73,542	.....
Rubber cloth for technical purposes						
Germany	$23,208	$1,117	$2,525	$9,302	$6,622	$16,876
France	1,380	6,454	4,544	114,601	17,437	87,043
England	21,703	302	74,627	160	96,290	2,788
Italy	.....	.....	.....	.....	5,788	.....
United States	627	.....	1,312	.....	1,602	.....
All others	2,634	7,593	4,156	68,254	765	62,082
Totals	49,552	15,466	87,164	192,317	128,504	168,789
Rubberized textiles						
Germany	68,901	74,875	2,712	21,612	53,965	7,491
Italy	386	31,040	10,792	6,905	2,662	10,341
Rumania	.....	32,414	.....	40,356	.....	14,003
Argentina	.....	28,603	.....	42,100	.....	16,661
United States	193	.....	3,206	.....	1,771	.....
England	16,405	.....	46,057	118	70,640	23,259
France	.....	.....	.....	.....	30,846	34,350
All others	18,335	94,715	55,137	353,494	2,413	377,323
Totals	104,220	261,647	117,904	464,585	162,297	483,428
Miscellaneous manufactures of rubber						
Germany	89,866	1,722	14,769	2,809	40,741	.....
France	71,523	12,129	145,422	9,434	178,741	13,331
Italy	71,644	6,263	90,142	33,631	15,789	5,523
England	44,720	562	64,196	6,295	68,118	21,526
United States	301	.....	14,798	.....	24,859	.....
All others	12,663	12,384	2,219	73,976	8,676	100,114
Totals	$290,717	$33,060	$331,546	$126,145	$336,924	$140,494

ASBESTOS IN WESTERN AUSTRALIA

Deposits of asbestos, varying both in quantity and quality, are being found in many parts of western Australia, the best of these being in the Pilbarra district about 600 miles north of Perth. Prospects for the industry have been sufficiently promising to induce a Sydney firm to establish asbestos works outside of Perth for the manufacture of asbestos sheets, roofing tiles, and other construction utilities.

The Rubber Trade in the Far East

By Our Own Correspondent

Malaya

The Failure of Restriction

The Colonial Office in London has given its final decision against compulsory restriction of rubber; the Rubber Growers' Association's plan has fallen through and there is no new scheme to take its place; therefore some planters have occasion to rail against the Government for not having declared itself long ago, to criticize those who are responsible for the failure of the restriction scheme and to berate the Department of Agriculture for not having investigated new products and forced planters to take them up.

They seem to have forgotten the warnings of the wiser planters; that very little could be expected from the Government; that Ceylon and Java, with their low production costs and other crops were not so hard hit and therefore not so keen on restriction; and finally that they should not put all their eggs in one basket but try to develop other crops.

The clue to the whole situation is found in this neglect to cultivate other crops. When the slump came, the planters who had grown rich on rubber found that they had nothing to fall back upon and were lured on by salvation schemes based on the fallacious idea that all planters could be equally benefited and the industry restored to its former prosperity by any one set of regulations.

Meanwhile nothing has been done and nothing gained. European and native labor has been discharged in the face of all warnings to keep in the land the labor force got together with such difficulty and cost. The real handicap that Malayan enterprise suffers under is a lack of plentiful and cheap native labor. The Tamil coolies, who have generally been regarded here as the best workers for local purposes, have been allowed to return to India in large numbers. There is a good demand for labor in India owing to the expansion of industry and also there is a strong feeling against assisted coolie emigration from India. Finally, if the coolie can make both ends meet in India, it is difficult to induce him to leave home. At present Tamil coolies in Malaya are paid 35 to 40 cents a day and rice at cost. When conditions necessitate increasing the labor force, coolies would undoubtedly demand 60 to 70 cents, and this would greatly increase costs in Malaya.

All is not quite dark here, however. Some improvement in conditions is noted and for the past few weeks the rubber market has been firm with a steady upward tendency. This and reports of better business in America is causing a feeling that the tide has turned.

Rubber Goods from Vulcanized Latex

Much interest is being shown in the invention by a local scientist and chemist of a process for vulcanizing latex. *The Malay Mail* says:

"We have received samples of vulcanite and completed rubber shoe soles from an estate in the Peninsula which for the present shall be nameless. The estate in question is making a variety of rubber goods by hand, and is prepared as soon as the molds arrive from England to manufacture anything from a rubber sole to a motor car tire or tube.

"The sample of vulcanite can be sawed or cut, and a nail may be driven through it without splitting, cracking or in any way injuring the product. The sample of rubber sole can be bent double in all directions without cracking or marking the surface."

The paper quoted then speculates as to whether it would be more profitable to manufacture on the spot or not. With the product right here in its liquid form, shipping charges, cases and other costs of packing, would be saved. The paper continues:

"Although the finished articles are at present being manufactured under the most primitive conditions, the samples sent are undeniable evidence that the production of rubber and vulcanite articles in our country of Hevea plantations has gone far beyond the experimental stage and is a local industry of the future which should fear nothing in competition with its older and more firmly established predecessors."

Rubber Exports

During the month of August 12,023 tons of rubber were exported from the Straits Settlements, bringing the total for the first eight months of the year to 94,523 tons, value $64,882,000. This is a falling off of 39,766 tons and of $184,514,000 in value as compared with the figures for the same period last year. This shows that restriction has not been carried out to the extent desired. As a correspondent to a local paper points out, from data gathered from the latest list of rubber producers, 37 out of 68 estates are still producing about the same quantity of rubber as some twelve months ago, 19 are more or less on a fifty per cent restriction, 8 on a 25 per cent restriction, and 4 have apparently stopped tapping.

To come back to the export figures, the *Straits Echo* says:

"What some may be disposed to regard as an undesirable feature of these returns is the large amount consigned to America, 8,080 tons out of 12,023 going to the United States during August. America is one of the principal factors of the trade, and the markets there are heavily overstocked. It apparently follows that if large amounts are continually being shipped to the United States, the prospects of a substantial rise in the value of our product will be adversely affected, and the conduct of a trade formerly largely managed from Mincing Lane will pass into others' hands."

The August exports went to the following countries: 8,080 tons to America; 1,730 tons to the United Kingdom; 1,937 tons to Japan; 55 tons to Australia; Ceylon took 14 tons and Europe 193 tons. Japan's imports of rubber increased considerably being 13,213 for the eight months ended August, 1921, against 3,591 tons for the same period last year; America took 55,165 tons against 90,610 tons; Europe, 3,403 against 2,820 tons; Australia, 291 tons against 195 tons; Ceylon, 115 tons against 150 tons.

Ceylon

The Legislative Council has petitioned the Government to consider sympathetically the question of amending the present export duty on rubber so as to give the industry some relief at this time of acute depression. It was further suggested that a committee be appointed to consider the matter.

The Rubber Situation in Ceylon

Some interesting correspondence has appeared in local papers on the question of the Ceylon rubber situation. One writer urges the necessity of supporting schemes for restriction which up to the present have been turned down, due to the fact that producers here could still dispose of their output at a small profit. It is pointed out, however, that this profit has been possible because of the low rate of the rupee against sterling, a condition which is bound to change and which is already less favorable to Ceylon planters than it was.

Another writer reported that planters in Malaya were producing to capacity in order to cut down costs, and that on some estates undreamed of economies were being made so that these concerns have been able to put their rubber on the market at 20 dollar-cents, or 5½*d.* a pound. This Ceylon can do, too, but only while the rupee is at its present low rate.

Grafting Large Producing Trees

Another correspondent cites the successful experiments carried out by the Dutch with grafted stocks. Observation has shown that some trees consistently yield far above the average, instanced by a tree which for the last two years has yielded at the rate of over 3¼ ounces a tapping, and without scrap. The tree is small and 95 trees could be planted to the acre. Theoretically, this gives a yield of 2,850 pounds an acre for 150 days' tapping. Other trees have been known to give still higher yields. It

has been found that with plant propagation by means of grafting good qualities of trees can usually be perpetuated.

The Dutch believe in grafted stock and have 100 planted acres, whereas, in other countries grafting rubber has not yet been taken up to any extent. The writer warns that this matter of rubber grafting is difficult, but can be successful. If the Dutch but realize half their expectations, he says, they will within ten or fifteen years be able to swamp Ceylon and control the market. The importance of plant reproduction of large yielding rubber trees is realized by the Experimental Committee, which has offered a prize of 100 rupees—a rupee is worth about $0.33, normal—for the best show of 20 rubber grafts. In view of the difficulty of the experiment, this prize is considered too insignificant as an incentive to undertake the arduous work.

Rubber Stocks

The question as to the whereabouts of the huge surplus stocks is occupying a good many minds. If these stocks exist, why does the market so quickly respond to slight increases in demand?

Judging from America's purchases of rubber in Singapore and Ceylon she is not tapping any stocks. Perhaps, some suggest, the rubber put down as stock has deteriorated to such an extent that manufacturers refuse it while they can get new stock. The supposition that this may be the case is very pleasing, but quite recently Mr. Stevens, the well-known authority, said that plantation rubber does not deteriorate rapidly if ordinary precautions are observed

The accuracy of the stock returns is questioned, and the *Times of Ceylon* goes so far as to say that it knows for a fact that the very modest figure of 11,000,000 pounds stocks in Colombo is an over-estimate, and it is hoped that the stocks in Malaya have been similarly exaggerated.

Netherlands East Indies

The Agricultural Aid Bank, to assist deserving planting concerns, has just been incorporated. Its main office is at Batavia. The capital of 1,000,000 gilders (a gilder is equal to $0.40, normal), is divided into a hundred shares of 10,000 gilders each, and 81 have been taken. The Nederlandsche Handel Maatschappij has taken 25 shares; the Nederlandsch-Indische Handelsbank 25; the Nederlandsch-Indische Escompto Maatschappij 25; Tiedeman & Van Kerchem 2; George Wehry & Co. 2; John Peet & Co. 2. The firms just mentioned are the members of the Board of Administration.

The Rubber Trade in the Outer Possessions

The following is taken from the "Verslag omtrent Handel, Nijverheid en Handbouw" (Report on Commerce, Industry and Agriculture) for 1920:

The production of Hevea rubber in the south and east division of Borneo is of great importance, particularly in Martapoera and Oeloe Soengei. The quality of the native rubber is rather poor; the best rubber is prepared in Martapoera. The total quantity arriving amounted to 30,000 piculs (a picul equals 133⅓ pounds), and practically all of it was shipped to Singapore whence it was reexported to America and Europe. During the second half of 1920, America was not in the market for this product, and owing to this and the general depression, the price dropped from 125 gilders a picul in April, 1920, to 30 gilders a picul. The normal value of a gilder is 40.2 cents. The total exports of rubber and guttas from Bandjermassin were 10,591 tons in 1920, against 6,506 tons in 1919.

The exports of Hevea rubber from the western division of Borneo showed a decrease over those for the previous year, chiefly owing to the sudden drop in prices. In 1920, 1,404 tons were shipped to foreign countries against 1,641 in 1919, and 176 tons against 148 tons, to Java. The latter quantities all came from one English rubber firm. The price for first quality sheets dropped from 130 gilders a picul in January to 34 gilders a picul at the end of the year. From this division, too, were exported to Singapore about 412 tons of gutta jelutong, against 522 tons in 1919. For some time the price remained at 20 gilders a picul, but by December this price had fallen to 8 gilders a picul.

The quantities of gutta hangkang shipped from Pontianak increased somewhat, due to the good prices obtained during the first half of 1920. Prices which had been 50 gilders a picul went to about 25 gilders, and poorer qualities fetched 20 and 15 gilders a picul. From this port, too, were shipped small quantities of gutta merah, totaling 28 tons against about 64 tons in 1919. In this article prices were fairly well maintained. The highest quotation was 600 gilders a picul, in April. At the end of December first quality sold for 500 gilders a picul, and inferior grades for about 300 and 200 gilders a picul.

The Rubber Situation in the Netherlands East Indies

The report has been received of the committee appointed to consider the rubber situation in connection with a resolution passed last year at a meeting of the International Association for Rubber Cultivation in the Netherlands East Indies. It seems that even the committee could not agree as to the line of conduct to be pursued. The report ends with the optimistic remarks that though the situation is very difficult for some concerns, there is every reason to believe that this difficulty will not be of long duration. There are already signs that point toward a recovery, and it may be predicted that even if not a single measure is adopted, the rubber prices will shortly be very much better.

Company News

It is understood that the Sumatra Cultuur Mij "Serbadjadi" has succeeded in selling forward out of the 1922 crop, 60 tons for October-May delivery at 9*d.* a pound, and 60 tons June-December delivery, at 9¾*d.* a pound, f. o. b. Netherlands East Indies. At a reasonable rate of exchange for sterling, this would amount to 51 to 53 cents (Dutch currency) a half-kilo. The company's all-in costs are estimated at 35 to 40 cents a half-kilo. Furthermore, the concern has succeeded in straightening out difficulties with an American buyer who had contracted for 20 tons of rubber at 1.40 gilders, f. o. b. Belawan. This buyer has now decided to fulfil his obligations.

Another company is said to have made a contract calling for 10 tons a month at a price of 53 cents for prime sheets. It seems, therefore, that conditions are beginning to improve slowly but surely.

We learn from the *Soerabaia Handelsblad* that the Eerste Ned. Ind. Kabelfabriek, the sister company of the Netherlands Gutta-Percha Co., has had to stop the greater part of the construction of its new building, owing to lack of funds.

The directors of the Rubber Cultuurmaatschappij Soengei Rajah propose to dissolve the company.

Among the new companies reported by the *Javasche Courant* we find the Tabalong Kuvia Rubber Co., Limited, Soerabaya. The company is capitalized at 600,000 gilders—normal value of a gilder, 40.2 cents—and is directed by Ross Taylor & Co., Limited, Soerabaya. The Wall Rubber Estates, Limited, London, is the administrator.

Another company newly formed under the direction of Ross Taylor & Co., Limited, and administration of the British Rubber Estates of Borneo, Limited, is the Pengaron Rubber Estates Co., Limited, Soerabaya. The capital is 960,000 gilders.

Sumatra Exports

Exports from Belawan, Deli, Sumatra, during the first half of 1921 and 1920 were as follows: 1,476,000 kilos against 1,439,000 to the Netherlands; 2,846,000 kilos against 1,809,000 to England; 2,502,000 kilos against 4,545,000 to the United States;

3,701,000 kilos against 2,620,000 to Singapore; 94,000 kilos instead or 352,000 to Penang; 51,000 kilos instead of 5,000 to Australia; 20,000 kilos, against 5,000 to Germany, and nil against 90,000 kilos to Belgium. Altogether 10,690,000 kilos against 10,865,000 kilos in 1920.

From Padang, Sumatra, were shipped 2,063 piculs of gutta percha, and 5,611 piculs during the first half of 1921 and 1920, respectively.

ALTERNATE TAPPING—A RESTRICTION PLAN

E. Girard, a well-known planter in Indo-China, has carried out some very interesting experiments in alterate tapping on the Suzannah and Au-Lec estates. At the end of 1917, fine lots equal in area, number of trees, spacing, etc., were selected for tests. One lot was tapped daily; three lots were first tapped every other week, then every other fortnight, and from August, 1919, every other month; one lot was tapped first, ten days out of thirty, then one month in three. In all cases tapping was stopped on Sundays.

It was found that the yields per day hectare (2.457 acres) for the three different groups were:

	Group 1 Kilos	Group 2 Kilos	Group 3 Kilos
1918	0.339	0.258	0.146
1919	0.429	0.298	0.253
1920	0.600	0.571	0.512

The number of tappers required for alternate tapping was just half that required in daily tapping. The amount of bark consumed was 50 per cent less, and bark renewal was more rapid and more complete. Bark diseases disappeared and other diseases were less frequent and less dangerous.

Yields are 80 per cent lower during the first few months after the change from daily tapping. For the first year after the change, the reduction was about 50 per cent. As the yields increase rapidly after the first year, the output approaches that obtained by daily tapping in a few years. Up to a certain limit, the highest yields have been obtained with the longest intervals of consecutive tapping and consecutive days of rest.

Mr. Girard believes that if his method was generally adopted, restriction would automatically follow, less labor would be needed and the trees would get a well-earned rest. Besides this, as the output increased rapidly after a time, increased demand would readily be met.

Forecasts End of Crisis

In an article published in the *Bulletin des Caoutchoucs de l'Institut Colonial de Marseille*, Mr. Girard states that the very seriousness of the present rubber crisis is a guaranty for the shortness of its duration. He believes that the price of rubber is bound to rise appreciably soon—if planters understand where their own interests lie—but in any case before the end of 1922.

Mr. Girard gives figures to show that instead of overproduction, the output will hardly keep pace with the consumption during 1921 to 1932. During the last year or so very little has been added to the planted area and, owing to the present conditions, the rubber acreage will not be increased in the near future. As it takes several years for trees to reach the tapping stage, the productive area will be for the next 10 years at least, about 3,000,000 acres at most. The average yield per hectare over all the tappable area is not more than 300 kilos per hectare, so that the next ten years' production would be from 240,000 to 360,000 tons annually. The yield per hectare could be brought up to 500 kilos if his alternate tapping methods were adopted and then the maximum annual yield would be 600,000 to 650,000 tons of rubber.

Consumption Greater Than Production

Consumption increases at the rate of 20 per cent, but for the next ten years it would be advisable to make this 10 per cent. A comparison of production and consumption figures follows:

	Consumption Tons	Production Tons
1921	270,000	270,000
1925	495,000	390,000
1929	720,000	530,000
1932	958,000	670,000

The apparent low yield per acre is explained thus: While some estates have areas with a high output, the average is reduced by the trees that are in various stages of production; also, just when trees should be yielding their maximum, they often become diseased through overtapping; finally, due to intensive tapping, the period during which trees yield their best becomes unnaturally brief.

INCREASING TRADE OF THE FEDERATED MALAY STATES

That the trade of the Federated Malay States is steadily increasing is evidenced by recently compiled statistics. Rubber, the leading export, was valued at £22,058,240 in 1919, and £20,851,320 in 1920. Imports of cycles, motor cars, motor cycles and accessories were estimated at £121,650 in 1919, increasing to £482,660 in 1920. A comparison of values of imports and exports of all commodities during recent years follows:

	Imports £	Exports £
1916	8,122,463	25,660,096
1917	8,547,200	31,736,011
1918	8,720,920	26,024,399
1919	13,866,412	32,565,762
1920	19,894,247	33,683,498

THE RUBBER TRADE IN MADAGASCAR

According to a consular report, trade conditions in Madagascar, both as regards imports and exports, have been gradually improving, until the situation has reached almost pre-war standards. The island, next in size to New Guinea and Borneo, and divided, for administrative purposes, into 26 provinces and districts, exports rubber from two of these provinces, while the imports of rubber goods, particularly such articles as rainproof coats, are steadily increasing.

JAPANESE INDUSTRIAL COMMISSION VISITS UNITED STATES

A Japanese industrial commission to the United States which landed in Seattle in the latter part of October visited New York City during the first weeks of the month following. The commission was entertained during the stay in New York by the Japan Society, the Chamber of Commerce and other large organizations. Among the many industries represented by this visiting commission the following names should be mentioned: Dr. Takuma Dan, chairman of the party and managing director of the combined Mitsui interests; Jakuro Kadono, director of the Yachiyo Rubber Co.; Gisaku Takigawa, auditor of the South Sea Rubber Plantation Co.; and Baron Kumakichi Nakashima, director of the Japan-Singapore Rubber Co. and Yokohoma Rubber Co.

The commission as a whole represents the most important commercial and financial interests of Japan, and the visit is with a view to further friendly relations between the two countries. The arrival of the party, although simultaneous with the disarmament conference, is held to have more industrial than political significance.

AN EXPLOSION THAT OCCURRED RECENTLY IN AN ENGLISH RUBBER factory caused the death of seven men and injury to nine others. Cotton fabric impregnated with rubber solution and rolled into bundles is taken to the naphtha recovery plant, where the excess of naphtha is removed, before being taken to the steam heating frame. The accident occurred when, by an oversight, a roll of cotton fabric was carried directly to the warming frame from the spreading shop. It is presumed that the explosion was caused by a spark from the calender motor or by a spark of static electricity generated by the passage of the fabric over the steel frame of the warming machine.

Recent Patents Relating to Rubber

The United States

Granted September 27, 1921

NO. 1,391,857 Support for tire casings. A. P. Schmitt, Buffalo, N. Y.
1,391,855 Cushion spring heel for shoes. H. Fraternali, Dobbs Ferry, N. Y.
1,391,985 Spring tire with cushion body. G. E. Siino, Pittsburg, Calif.
1,392,009 Demountable rim for tires. T. G. Gerdine, West Falls Church, Va.
1,392,085 Syringe. F. W. Stanton, Chicago, Ill.
1,392,089 Fountain pen. J. Straka, assignor of ½ to J. R. Lewis, both of Chicago, Ill.
1,392,101 Abdominal belt. F. G. Baugatz, Paris, France.
1,392,190 Windshield cleaner. B. I. Malouf, Salt Lake City, Utah.
1,392,201 Boot and shoe sole composed of alternating strips of rubber and textile material vulcanized together. A. D. Nearon, Muncie, Ind.
1,392,231 Tire deflator. M. Shimada, Kahului, Hawaii.

Granted October 4, 1921

1,392,292 Demountable rim for tires. E. G. Blue, Grape Creek, Ill.
1,392,303 Union garment having belt with elastic insert. B. Custer, Santanta, Kans.
1,392,314 Garment supporter. J. N. and C. A. Faust, both of Chicago, Ill. (See THE INDIA RUBBER WORLD, August 1, 1920, page 739).
1,392,433 Spring tire. F. C. Miller, Chicago, Ill.
1,392,440 Valve control for pneumatic tires. J. N. Newsom, assignor to Newsom Valve Co.—both of St. Louis, Mo.
1,392,533 Inflatable fabric boat and bed or cushion. C. F. Smith, assignor to Connecticut Aircraft Co.—both of New Haven, Conn.
1,392,540 Reinforced spring tire. G. Tremolada, Detroit, Mich., assignor of ½ to M. Baroni, Winnipeg, Manitoba, Can.
1,392,569 Self-filling fountain pen. E. Hugetz, New York, N. Y.
1,392,571 Resilient tire. R. H. Bowman, assignor to Firestone Tire & Rubber Co.—both of Akron, O.
1,392,671 Resilient tire. J. M. Abrams, Brooklyn, N. Y.
1,392,672 Resilient tire. J. M. Abrams, Brooklyn, N. Y.
1,392,746 Cap for tire-valve tubes. D. H. Cox, Roselle, N. J.
1,392,823 Cushion heel. H. Faegenson, Chicago, Ill.
1,392,826 Inner tube. W. P. Gordon, Edgefield, S. C., and T. B. Jacocks, Tarboro, N. C.
1,392,838 Self-filling fountain pen. H. Lewinson, Erie, Pa.
1,392,853 Inner tube having plurality of air chambers. H. Ryder, New York, N. Y.
1,392,859 Spring wheel with cushion tire. W. H. Smith, Bridgeport, Conn.
1,392,860 Filling device for fountain pens. E. Perina, Port Richmond, N. Y.
1,392,861 Balloon toy. J. Tabacco, Rochester, N. Y.
1,392,894 Puncture-proof inner tube. R. R. Lloyd, assignor of ½ to J. Griffin—both of Des Moines, Ia.

Granted October 11, 1921

1,392,923 Tire valve. G. E. Draper, Pittsburg, Kans.
1,392,951 Pneumatic tire. E. W. Lee, Los Angeles, Calif.
1,392,953 Pneumatic tire having bead-retaining devices of greater than normal circumference. W. D. McNaull, assignor to Mrs. M. K. McNaull—both of Toledo, O.
1,393,030 Tire rim. H. M. Lambert, Portland, Ore.
1,393,185 Puncture-proof, reinforced, cushioned shoe for pneumatic tires. S. J. Todd, assignor of ¼ each to H. N. A. McLean and R. M. Tate—all of Detroit, Mich.
1,393,196 Detachable tire protector with rubber body. B. E. Breitweiser, Wichita, Kans.
1,393,441 Detachable wire-spoked wheel. W. H. Heales, Coventry, assignor to The Dunlop Rubber Co., Limited, London—both in England.
1,393,514 Pneumatic vehicle wheel. A. W. Eckhardt, New York, N. Y.
1,393,673 Rubber silencer for communion-cup racks. M. P. Dingee, Philadelphia, Pa.

Granted October 18, 1921

1,393,773 Tire reinforced with sheet metal. E. Grill, Grand Rapids, Mich.
1,393,811 Hose clamp. W. Mossholder and G. J. Shultz, both of Mount Vernon, O.
1,393,903 Fountain pen. H. L. Perez, Yonkers, N. Y., and T. Veitch, Englewood, N. J.
1,393,909 Cushion tire. J. Saulsberry, Peoria, Ill.
1,393,952 Tire casing. C. E. Miller, Anderson, Ind.
1,394,009 Rim for pneumatic tires. C. N. Hauffe, Columbus, O.
1,394,053 Windshield cleaner. H. C. Tripp, Auburn, N. Y.
1,394,206 Massage brush. F. I. Mathieu, South Bend, Ind.
1,394,252 Tire rim. T. W. Costello, San Francisco, Calif.
1,394,300 Reinforced rubber hose. J. R. Gammeter, Akron, O., assignor to The B. F. Goodrich Co., New York, N. Y.
1,394,316 Garment supporter. J. H. L'Heureux, Lowell, Mass.
1,394,322 Hydrometer syringe. H. S. Marshutz, assignor to American Thermo-Ware Co.—both of New York, N. Y.
1,394,330 Demountable rim for tires. A. H. and G. M. Momeyer, Brooklyn, N. Y.
1,394,358 Cushion tire. J. Rosick, Dawson, N. Mex.

Granted October 25, 1921

1,394,589 Cushion tire. B. C. Swinehart, Akron, O.
1,394,658 Demountable tire with flattened arch. J. S. Williams, Riverton, N. J. Original application divided.
1,394,787 Pneumatic tire. W. P. Porter, New York, N. Y.
1,395,051 Dirigible balloon. A. C. Mikanovich, Cleveland, O.
1,395,058 Rubber floor cleaner. F. W. Nevius, St. Louis, Mo.
1,395,192 Garter. E. Landgraf, born Cartharius, Dresden, Germany.

The Dominion of Canada

Granted September 20, 1921

213,400 Umbrella cover with elastic gusset in placket. I. H. Weinberg and C. F. Bisbing, coinventors—both of New York City, U. S. A.

Granted September 27, 1921

213,517 Rubber eraser formed with enlarged center. E. P. Clauss, Lyons, New York.
213,534 Combined dust cap and valve cap for pneumatic tires. A. Kufer, Salem, Ore., U. S. A.
213,550 Solid tire of alternate spiral layers of rubber and fibrous material treated with a non-colloidal sulphur-terpene compound and an outer layer of rubber, all vulcanized together. W. B. Pratt, Wellesley, Mass., U. S. A.

Granted October 4, 1921

213,625 Rubber-coated balata belting. J. Dawson, Lincoln, Eng.
213,673 Resilient wheel. E. Schultz, East Melbourne, Victoria, Australia.
213,698 Life-saving apparatus. M. C. Steese, Hamburg, New York, U. S. A.

Granted October 11, 1921

213,743 Horse overshoe with rubber calks. P. Mallett, Toronto, Ont.
213,757 Tire alarm device. O. F. Schroeder, Santa Ana, Calif., U. S. A.
213,785 Vulcanized boot or shoe. The Canadian Consolidated Rubber Co., Limited, Montreal, Que., assignee of L. A. Trull, Williamsport, Pa., U. S. A.

Granted October 18, 1921

213,802 Liner for reinforcing the covers of pneumatic tires. W. H. A. Theed and A. T. Phillips, coinventors—both of London, Eng.
213,824 Pneumatic pilot seat for airplanes. Ihachi Hatano, Kimitsu-Gun, Chiba-Ken, Japan.

Granted October 25, 1921

213,991 Split demountable rim for tires. J. T. and A. L. Cadenhead, assignee of ½ interest—both of Ensley, Ala., U. S. A.

The United Kingdom

Published September 28, 1921

167,183 Pneumatic tire. P. Nivet, Luxé, Charente, France. (Not yet accepted.)
167,292 Reconstructed tire. W. C. Taylor; Ripley Strong & Co., Farnborough, Hampshire.

Published October 5, 1921

167,618 Spring tire. W. H. Robinson, 433 Rogers avenue, Brooklyn, and S. E. Hall, 24 Broad street, Manhattan—both in New York, U. S. A.
167,644 Protective covering of vulcanite, rubber, etc., for cycle handlebars. J. F. Smith, 31 Speedwell Road, Edgbaston, Birmingham.
167,683 Device to prevent cracking of a solid tire. St. Helen's Cable & Rubber Co., Limited, and H. Evans, Bank Quay, Warrington.
167,723 Raincoat. C. H. Place, 34 Beechmont Drive, New Rochelle, New York, U. S. A.

Published October 12, 1921

167,825 Detachable rims for tires. J. Albaya y Verdud, 71 West View Road, Barrow.
167,906 Thimble-shaped rubber body for cleaning teeth and massaging the gums. W. S. Benson, 24 Cecil Road, Prenton, Birkenhead.
168,051 Device for deflating pneumatic tires. A. Schrader's Son, Inc., 479 Vanderbilt avenue, Brooklyn, New York; assignee of H. P. Kraft, 219 Godwin avenue, Ridgewood, New Jersey—both in U. S. A. (Not yet accepted.)
168,052 Dust cap for tire valves. A. Schrader's Son, Inc., 479 Vanderbilt avenue, Brooklyn, New York; assignee of H. P. Kraft, 219 Godwin avenue, Ridgewood, New Jersey—both in U. S. A. (Not yet accepted.)
168,053 Dust cap for tire valves. A. Schrader's Son, Inc., 479 Vanderbilt avenue, Brooklyn, New York; assignee of H. P. Kraft, 219 Godwin avenue, Ridgewood, New Jersey—both in U. S. A. (Not yet accepted.)
168,063 Rubber heel to put over Cuban or French heels by hand. R. E. Miller, Inc., 11 Broadway, New York, U. S. A.; assignee of R. E. Miller. (Not yet accepted.) See The India Rubber World, August 1, 1917, page 655.
168,116 Rubber driving belt for dynamos, motor vehicles, etc. T. A. E. Haywood, Purley, Surrey.

Published October 19, 1921

168,204 Welted boot or shoe waterproofed by beaded strip of rubber inserted between upper and welt or combined with welt. J. Marlow & Sons, Limited, P. Hutton, and G. H. Chapman, Phoenix Shoe Works, St. George's street, Northampton.
168,221 Rubber heel or sole. Wood-Milne, Limited, 2 Central Buildings, Westminster, and E. R. Pearce and T. W. Barnes, Ajax Rubber Works, Leyland, Lancashire.

Chemical Patents will be found on pages 195, 196. Machinery Patents on page 199.

168,248 Medical syringe. J. D. Serra, 90 Balmes, Barcelona, Spain.
168,274 Nursing bottle of rubber. W. E. Goddard, 313 Main street, Watertown, Wis., U. S. A.
168,292 Two-part balloon toy. T. S. D. Schmidt, 1 Sankelmarksgade, Copenhagen.
168,401 Reservoir pen. W. J. McDonald, Box 704, Sioux City, Ia., U. S. A.

Published October 19, 1921

168,560 One-piece raincoat to resemble coat and skirt. J. Mandleberg & Co., Limited, and W. Wood, Albion Waterproofing Works, Pendleton, Manchester.
168,591 Waterproof life-saving suit with inflatable buoy. K. Souliotis, 258 West 30th street, New York, U. S. A. (Not yet accepted.)
168,619 Multiply fabric for tire casings, with bias-woven margins. C. Zeglen, 118 North La Salle street, Chicago, Ill., U. S. A.
168,671 Boat plug. M. Lewis, 6 Adelaide Terrace, Portishead, Somerset.
168,787 Device for practicing and teaching golf. H. T., F., and C. Thorp, Victoria Works, Whitefield, near Manchester.
168,797 Collapsible rim for tires. W. Dukes and Warland Dual Rim Co., Limited, Lythalls Lane, near Foleshill, Coventry.

New Zealand

Published September 8, 1921

43,950 Pneumatic seat. H. Seibel, 572 Folsom street, San Francisco, Calif., U. S. A. (See The India Rubber World, February 1, 1921, page 345.)
44,831 Rubber sole. A. J. Hewson, 14 Miro Road, Green Lane, Auckland, N. Z.

Published September 22, 1921

45,183 Talking-machine reproducer with sound-box body of soft rubber. F. Adams, 1723 Chestnut street, Philadelphia, Pa., U. S. A.

Germany

Patents Issued With Dates of Issue

343,375 (August 10, 1920) Resilient tire. A. Freund, Behrischstrasse 21, Dresden.
343,376 (February 1, 1920) Tread. Societa Fabbricazione Esportazione Copertoni Imperforabili Torino, Turin, Italy; represented by Dr. E. Müller, Berlin S. W. 68.
343,377 (January 25, 1921) Cell air tube. Otto Trampusch, Alexanderstrasse 22, Augsburg.
343,432 (October 12, 1918) Resilient tire. Hermann Debor, Goethestrasse 4, Munich.
343,601 (July 31, 1920) Rubber finger cot. Max Arnfeld, Brehmstrasse 26, Düsseldorf.
343,822 (July 2, 1920) Resilient rupture band. Heinrich Westphal, Helmstedterstrasse 4, Berlin-Wilmersdorf.
344,053 (August 21, 1920) Rupture band. Max Georgi, Kl. Schulstrasse 17, Magdeburg.
344,455 (August 1, 1918) Resilient tire. Hermann Kaufmann, Lessingstrasse 4, Düren, Rheinland.

TRADE MARKS

The United States

Two Kinds of Trade Marks Now Being Registered

Under the rules of the United States Patent Office, trade marks registered under the Act of February 20, 1905, are, in general, fanciful and arbitrary marks, while those registered under the Act of March 19, 1920, Section 1 (b), are non-technical, that is, marks consisting of descriptive or geographical matter or mere surnames. To be registered under the latter act, trade marks must have been used for not less than one year. Marks registered under this act are being published for the first time when registered, any opposition taking the form of an application for cancellation.

Granted September 27, 1921, Act of February 20, 1905

No.
147,001 INDIAN DELIGHT—chewing gum. The India Co., Newark, N. J. Granted October 4, 1921, Act of February 20, 1905.

Granted October 4, 1921, Act of February 20, 1905

147,072 MICRONEX—gas black and carbon black in bags. Binney & Smith Co., New York, N. Y.

Act of March 19, 1920, Section 1 (b)

147,223 HUGG-TITE—sheet rubber patches. Hugg-Tite Patch Co., Wellston, O.
147,241 NORWALK—Tires. The Norwalk Tire & Rubber Co., Norwalk, Conn.
147,249 PEDALGRIPS—treads for automobile pedals. Gilbert I. Stadeker, Chicago, Ill. (See THE INDIA RUBBER WORLD, September 1, 1920, page 818.)

Granted October 11, 1921, Act of February 20, 1905

147,332 KATTLE KING—rubber boots and shoes. Hood Rubber Co. Watertown, Mass.
147,376 AMAZON—tires and tubes. New South Rubber Co., Atlanta, Ga.
147,391 R with & in the upper part and S in the lower—repair patch of molded and sheet rubber for rubber footwear. Robertson & Sons, Shoe Repairers, Inc., New York, N. Y.
147,420 KITCOAT—waterproof coats. A. J. Tower Co., Boston, Mass.
147,431 VENTILATO—raincoats. Western Textile Co., Chicago, Ill.
147,433 NAVAJO—tire patches. Conrad Wilkey & Co., Casper, Wyo.

Granted October 18, 1921, Act of February 20, 1905

147,453 SEA-LION—raincoats, slickers, waterproof clothing. Dickson Raincoat Co., Dickson, Tenn.

Act of March 19, 1920, Section 1 (b)

147,480 MINITMEND REPAIR FOR TIRES AND TUBES—superimposed on figure of a minuteman within representation of a tire around which are the words, ONE MINUTE REPAIR, MINITMEND ARE THE BEST BY TEST—tire and tube repairs. The Continental Rubber Co., Philadelphia, Pa.
147,519 IT WILL NOT BREAK—rubber-finished, vacuum-jacketed receptacles. Stanley Insulating Co., Great Barrington, Mass. (See THE INDIA RUBBER WORLD, May 1, 1919, page 429.)

Granted October 25, 1921, Act of February 20, 1905

147,604 UNIVERSAL—Calender stock shells. The W. F. Gammeter Co., Cadiz, O.
147,610 WHITE KING—fabric-reinforced rubber hose. The B. F. Goodrich Co., New York, N. Y.
147,616 SPEE-D-PATCH—tire and tube patches. Hadley Bros.-Uhl Co., St. Louis, Mo.
147,635 IRON GRASP—composition rubber cement. Lord & Brown, Des Moines, Ia.
147,638 COOTIE—rubber patching stock and transparent cement. B. M. Major, Detroit, Mich.
147,642 COMPO—belts for personal wear. The Miller Rubber Co., Akron, O.
147,665 SPRINGBOK—braces, suspenders, garters, etc. John Patterson, Jr., Aldershot, England.
147,666 Representation of a hand holding a package—waterproof coats. Pearson Brothers, London, England.
147,696 PADO SHIELD GARTER—garters. A. Stein & Co., Chicago, Ill
147,717 L. C. SMITH—shoes of leather, canvas and rubber. E. A. Weil Co., East Savannah, Ga.

The Dominion of Canada

Registered

29,200 ALL-WEATHER—manufactured rubber and balata goods, including tires, tubes, accessories, belting, hose, packing, tubing, molded goods, cement, and leather substitutes. The Goodyear Tire & Rubber Co. of Canada, Limited, New Toronto, Ont.
29,212 WACRO—all kinds of packing. The Westinghouse Air Brake Co., Wilmerding, Pa., U. S. A.
29,273 TIRE-ITE—tire paint. Adams & Elting Co., Toronto, Ont.
29,280 PENINSULAR—tires, tubes, druggists' sundries, heels and soles, and hose. The Peninsular Cord Tire & Rubber Co., Limited, Hamilton, Ont.
29,325 SPENWOOD—general rubber goods. George Spencer, Moulton & Co., Limited, and Wood-Milne, Limited, 2 Central Buildings, Westminster, London, S. W. 1, England.
29,335 REGAL TIRES NEVER TIRE—tires. Regal Tire Co., Sherbrooke, Que.
29,429 LIFE BUOY PRES-CURE—footwear, particularly wholly or partly of rubber. The Kaufman Rubber Co., Limited, Kitchener, Ont.
29,432 THE CURRIE MAKE—suspenders, garters, etc. The E. & S. Currie, Limited, Toronto, Ont.
29,509 SCHRADER—tire and other valves and parts, water-bottle and other stoppers, syringe fixtures, gages, indicators, etc. A. Schrader's Son, Inc., New York, New York, U. S. A.
29,510 UNIVERSAL—tire and other valves and parts, water-bottle and other stoppers, syringe fixtures, gages, indicators, etc. A. Schrader's Son, Inc., New York, New York, U. S. A.
29,530 Representation of an outstretched hand, palm uppermost, holding small parcel representing a mackintosh tightly rolled—waterproof coats and other clothing. Pearson Brothers, 45 Conduit street, Bond street, London, W., England.
29,575 NIMBLE STEP—general rubber goods. The F. E. Partridge Rubber Co., Limited, Guelph, Ont.
29,578 ASBESTONOS BRAKE LINING on the representation of a wheel through which passes a band of brake lining bearing the word ASBESTONOS and having the sides painted in gold—brake lining. Asbestonos Company Brake Lining, East Broughton, Que.
29,581 Representation of a winged arrow enclosed in a circle within which is another circle concentric to the first and intercepted by the head, tail and wings of the winged arrow, and the words TRADE MARK—tires, heel and sole tips and pads, etc. Wood-Milne, Limited, 2 Central Buildings, Westminster, London, England.

New Zealand

Published September 22, 1921

17,362 OLD COLONY—all kinds of rubber goods. Hood Rubber Co., Boston, Mass., U. S. A.
17,575 Representation of an arrow and an anchor within the inner of two diamonds, and the words NATIONAL INDIA RUBBER COMPANY in the border formed by the two diamonds—footwear of canvas and rubber, particularly shoes. National India Rubber Co., Bristol, Rhode Island, U. S. A.

The United Kingdom

Published October 5, 1921

413,252 Representation of a tire personified, pouring something from a can into its mouth—manufactured rubber and gutta percha goods. V. Villa, 89 rue Riquet (Haute Garonne), Toulouse, France; address for service in the United Kingdom, care of Marks & Clerk, 57 Lincoln's Inn Fields, London, W.C.2.
413,598 MARATHON on a panel, separated in the middle by the body of a marathon runner—belts for wear. The Marathon Tire & Rubber Co., 140 Front street, Cuyahoga Falls, Ohio, U. S. A.; address for service in the United Kingdom, care of F. Heron Rogers, Bridge House, 181, Queen Victoria street, London, E. C. 4. (See THE INDIA RUBBER WORLD, June 1, 1921, page 673.)
417,778 BIG BERTHA—golf balls, etc. H. Nalty, trading as Gourdel Vales & Co., 57 Great Marlborough street, Regent street, London, W.1.

Published October 12, 1921

413,929 DURADUR—goods manufactured from rubber and gutta percha, not included in classes other than No. 40, except boot and shoe pads and tips. Pahl'sche Gummi-und Asbest-Gessellschaft mit beschränkter Haftung, 43 am Gatherof, Dusseldorf-Rath, Germany; address for service in the United Kingdom, care of Jensen & Son, 77 Chancery Lane, London, W.C.2.

417,046 CAMBRITE—electric cables. W. T. Glover & Co., Limited, Trafford Park Road, Trafford Park, Manchester.

Published October 19, 1921

405,480 Representation of two draped flags and a life-saver conventionally decorated with rope; inside the life-saver the representation of a hand clasped over a section of cable and the words BRITISH MADE—electric cables. Ward & Goldstone, Sampson Works, Springfield Lane, Salford, Manchester.

406,714 SAFETEE—brushes with bristles set in rubber cement. Safetee Soap Corporation, 305 Jay street, Brooklyn, New York, U.S.A., address for service in United Kingdom, care of White, Langner, Stevens & Parry, Jessel Chambers, 88-90 Chancery Lane, London, W. C. 2.

414,644 TRIPOLIN arranged as a monogram—rubber and gutta percha goods not included in classes other than No. 40. Köln-Rottweil Aktiengesellschaft, 8 Hindersinstrasse, Berlin N. W. 40, Germany; service in the United Kingdom, care of Haseltine, Lake & Co., 28 Southampton Buildings, London, W.C.2.

414,929 DURAL RUBBER inside the outline of an Indian arrow-head, the central R of the first word forming the first R in the second and the two words arranged as a T—tires, tubes, and hose. Dural Rubber Corporation, Maple avenue, Flemington, New Jersey, U. S. A.; service in the United Kingdom, care of Marks & Clerk, 57 Lincoln Inn Fields, London, W.C.2.

416,954 The letter H with a six-pointed star above and below the cross-bar—ink erasers, rubber bands, fountain pens, etc. L. & C. Hardtmuth, Gerstnerstrasse 58, Budweis, Bohemia, Czecho-Slovakia; for service in United Kingdom, care of A. M. & William Clark, 53 Chancery Lane, London, W.C.2.

Published October 26, 1921

417,382 Representation of a label bearing the words RAINPROOF & POROUS JACKSONIA-RESISTRA YARNPROOF LINED WITH GUARANTEED ALL WOOL SCOTCH TWEED JACKSONS LIMITED SPECIALTY—rainproof and waterproof clothing. Jacksons Limited, Victoria Works, Howard street, Stockport, Cheshire.

418,051 C on device resembling conventionalized umbrella top—rubber boot and shoe protectors. T. R. Lulham, 112 Becker street, Bellevue East, Johannesburg, South Africa; service in the United Kingdom, care of Abel & Imray, 30 Southampton Buildings, London, W.C.2.

418,074 SUPERITE—fountain pens, etc. De Witt-La France Co., 54 Washburn avenue, Cambridge, Mass., U. S. A.; service in the United Kingdom, care of Herbert Haddan & Co., 31 Bedford street, Strand, London, W.C.2.

DESIGNS

The United States

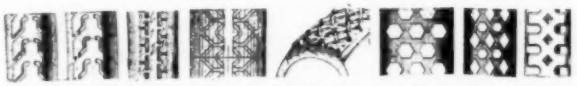
Granted October 4, 1921

No.

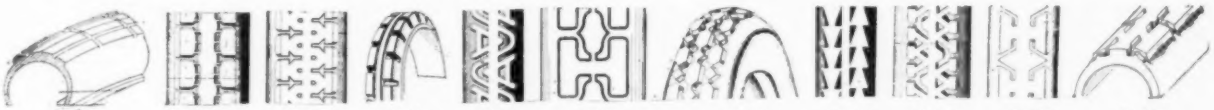
59,174 Tire casing. Term 14 years. R. D. Belden, assignor to Madison Tire & Rubber Co., Inc.—both of Buffalo, N. Y.

59,180 Tire tread. Term 7 years. A. L. Breitenstein, Akron, assignor to The Giant Tire & Rubber Co., Findlay—both in Ohio.

59,245 Tire tread. Term 7 years. C. E. McCormick, Youngstown, O.



59,304 59,305 59,511 59,526 59,441 59,442 59,443 59,494



59,268 59,174 59,180 59,310 59,321 59,245 59,312 59,322 59,418 59,273 59,426

59,268 Tire tread, Term 14 years. Granted under provisions of Act of March 3, 1921, 41 Statute Law, 1313. W. H. Paull, Birmingham, assignor to The Dunlop Rubber Co., Limited, London—both in England.

59,310 Tire. Term 14 years. R. H. Waters, Cumberland, Md., assignor to Kelly-Springfield Tire Co., New York, N. Y.

59,312 Tire tread. Term 7 years. W. F. Wiley and A. Reisenberg, Salt Lake City, Utah.

Granted October 11, 1921

59,321 Tire casing. Term 7 years. C. R. Baker, Akron, assignor to The Akron Universal Tire & Rubber Co., Medina—both in Ohio.

59,322 Tire casing. Term 7 years. C. R. Baker, Akron, assignor to The Akron Universal Tire & Rubber Co., Medina—both in Ohio.

59,366 Golf ball. Term 7 years. P. A. Martin, Birmingham, Eng.

Granted October 18, 1921

59,418 Tire. Term 14 years. G. Grow, assignor to George Grow Tire Co.—both of Boston, Mass.

59,426 Non-skid tread for airless or pneumatic tires. Term 7 years. J. A. MacMillan, Dayton, O.

59,441 Tire. Term 3½ years. R. S. Trogner, assignor to The Goodyear Tire & Rubber Co.—both of Akron, O.

59,442 Tire. Term 3½ years. R. S. Trogner, assignor to The Goodyear Tire & Rubber Co.—both of Akron, O.

59,443 Tire. Term 3½ years. R. S. Trogner, assignor to The Goodyear Tire & Rubber Co.—both of Akron, O.

Granted October 25, 1921

59,494 Tire. Term 14 years. E. J. Kraft, assignor to Racine Rubber Co.—both of Racine, Wis.

59,511 Tire. Term 14 years. E. Phillips, assignor to The Yale Tire & Rubber Co.—both of New Haven, Conn.

59,526 Tire. Term 7 years. R. J. Smith, assignor to Continental Rubber Works—both of Erie, Pa.

The Dominion of Canada

5,197 Non-skid tire tread. Patented October 18, 1921. Ames Holden McCready, Limited, Montreal, Que.

Germany

Design Patents Issued With Dates of Issue.

790,937 (October 14, 1920) Rupture band. Charles Cluthe, Sr., Mainluftstrasse 9, Frankfort-on-the-Main.

791,296 (August 3, 1921) Syringe for medical purposes. Dr. Apastol Waswassof, Küstrinerstrasse 126, Berlin.

791,383 (July 20, 1921) Injection syringe with bulb enameled inside. Georg Hasse, Andreasstrasse 21, Berlin.

791,938 (August 27, 1921) Surgical syringe with closing ring. A.-G. für Feinmechanik, formerly Jetter & Scheerer, Tuttlingen.

791,981 (August 11, 1921) Tube insert for bicycles and motorcycles. Otto Klein, Friedhofstrasse 1a, Mannheim-Neckarau.

792,023 (August 29, 1921) Rubber shoe sole with leather plate attached by vulcanization. Carl Paashaus, Wald, Rheinland.

792,133 (July 1, 1921) Rubber sole. Gummigesellschaft "Colonia" (Bruno Aschenbach & Co.), Köln-Kalk.

792,159 (August 19, 1921) Rubber tread patch for heels. Max Götze, Steuerwalderstrasse 20, Hildesheim.

792,170 (August 27, 1921) Feeding bottle with rubber nipple. Julius Riesenfeld, Waldemarstrasse 42, Berlin.

792,187 (August 29, 1921) Brush-like rubber bath glove. Wilhelm Untuzka, Frickestrasse 45, Hamburg.

792,234 (August 17, 1921) Metal inserts for bicycle and automobile tire covers, to protect the inner tube. A. Kniffka, Herten i. W.

792,242 (August 25, 1921) Stocking with rubber threads arranged spirally in the top. Fa. C. F. Drechsel, Thalheim, Erzgeb.

792,335 (August 9, 1921) Garter fastening consisting of wire hook and rubber plate with button. P. C. Turck, widow, Metallwaren-Fabrik, Lüdenscheid.

792,359 (August 29, 1921) Baby carriage tire having spiral inside. Continental-Caoutchouc-und Gutta Percha Compagnie, Hanover.

792,432 (August 4, 1921) Injection syringe. Wilhelm Rheinberg, Lorettostrasse 28, Düsseldorf.

793,351 (August 28, 1921) Syringe for medical and dental purposes. Robert Welter, Fregestrasse 27 b., Berlin-Friedenau.

793,379 (September 8, 1921) Medicinal syringe. Leonhard Kammer, Strelitzerstrasse 47, Berlin.

793,579 (August 6, 1921) Rust protector for bicycle, motorcycle and automobile rubber tires. Wilhelm Essich, Hanau-on-the-Main.

793,602 (September 8, 1921) Finger cot. Zieger & Wiegand, Leipzig-Vo.

793,609 (September 10, 1921) Rubber heel with insert. Gummiwerk India, G. m. b. H., Hanover-Hainholz.

793,944 (September 15, 1921) Exchangeable rubber patch. Albert Klaus and Friedrich Zillyer, Badersleben, Jerxheim.

794,137 (August 31, 1921) Rubber sole, Norddeutsche Gummiwaren-Fabrik Hannover, G. m. b. H., Hanover.

794,312 (June 3, 1921) Rubber heel. Industria Gesellschaft für Industriebedarf m. b. H., Hanover.

794,385 (September 19, 1921) Rubber heel. B. Georgi, Bettinastrasse 8, Offenbach-on-the-Main.

794,456 (September 17, 1921) Rubber holder for dental purposes. Dr. Fritz Nebel, Maximilianstrasse B. 2, Augsburg.

794,512 (September 1, 1921) Rubber insert for heels. Rudolf Theel and Stefan Klinkert, Helmholzstrasse 13, Charlottenburg.

794,531 (September 19, 1921) Insole with layer of sponge rubber. Hugo Klein, Heussweg 67, Hamburg.

794,591 (September 7, 1921) Elastic tire for automobiles and bicycles to take the place of pneumatic tires. Heinrich Dinkelbach, Unkel-on-the-Rhein.

794,617 (September 19, 1921) Elastic tire. "Sembusto" Elastische Radbereifungen G. m. b. H., Vienna; represented by L. Werner and E. Wurm, Berlin S. W. 11.

794,708 (September 20, 1921) Protective contrivance for rubber tires. Hermann Wagner and Max Ruch, Zell, Wiesental.

794,883 August 26, 1921) Rubber sole with leather insert. Peter Haas, Giesenstrasse 12, Mannheim-Neckarau.

794,923 (September 21, 1921) Ocular head with soft rubber inlay. Optische Anstalt Oigee, G. m. b. H., Berlin-Schöenberg.

794,999 (September 21, 1921) Rubber ball with names, words or proverbs printed, painted, vulcanized or stamped on the surface. Leo Grossmann, Dorfstrasse 36, Berlin-Mariendorf.

Review of the Crude Rubber Market

New York

THE railway strike threatened a month ago brought out requests from factories for shipment of November rubber in advance of the usual time. This caused a demand for spot and a higher and active market, but most of the business was for the accounts of dealers. The passing of the threatened strike eased the market situation. Quotations were: first latex and ribbed smoked sheets, spot, 16 cents, future position from 1 to 2½ cents in advance of spot.

The week ended November 5 exhibited a firm market with good volume of factory inquiries. First latex and ribbed smoked sheets ruled at practically the same price, which was 17 cents for spot.

During the week ended November 12, the market was very firm and active in spite of the single holiday early in the week and the double one at the close. Various dealers were actively buying, in both New York and London. The fact that certain manufacturers have been buying in the Far East and the lack of offers on all sides held the market very firm. Rubber is now in very firm hands; in fact there are more buyers than sellers. Dealers are not offering their stocks and quote only high prices.

The market during the week ended November 19, held very steady except on the 17th, when cables showed a weakness and spot sold at 17¾ cents, but the market advanced again, the quotations being 18¼ cents for spot.

Importations of all grades during October were 23,469 tons compared with 10,639 tons last year. Plantation arrivals for October were 21,602 tons compared with 8,759 tons one year ago. Total imports of all grades for ten months ended October 31, 1921, were 142,935 tons compared with 203,612 tons for the corresponding period in 1920.

Spot and future quotations on standard plantation and Brazilian grades were as follows:

PLANTATIONS. November 1. Spot, first latex crêpe, 16 cents; January—March, 17 to 17½ cents; January—June, 17½ to 18 cents; April—June, 18½ cents. November 23. Spot, first latex crêpe, 18¾ cents; January—March, 20 cents; January—June, 20½ cents; April—June, 21 cents.

November 1. Spot, ribbed smoked sheets, 16 cents; January—March, 17 to 17½ cents; January—June, 17½ to 18 cents; April—June, 18½ cents. November 23. Spot, ribbed smoked sheets, 18¾ cents; January—March, 20 cents; January—June, 20½ cents; April—June, 21 cents.

November 1. Spot, No. 1 amber crêpe, 16 cents; January—March, 16 cents. November 23. Spot, No. 1 amber crêpe, 18 cents; January—March, 19 cents.

November 1. Spot, No. 1 rolled brown crêpe, 12½ cents; January—March, 13½ cents. November 23. Spot, No. 1 rolled brown crêpe, 15 cents; January—March, 16 cents.

SOUTH AMERICAN PARAS AND CAUCHO. November 1. Spot, upriver fine, 22 cents; islands fine, 21½ cents; upriver coarse, 12 cents; islands coarse, 10 cents; Cametá, 10¼ cents; caucho ball, 11½ to 11¾ cents. November 23. Spot, upriver fine, 24 cents; islands fine, 21 cents; upriver coarse, 13 cents; islands coarse, 10 cents; Cametá, 10 cents; caucho ball, 12¼ cents.

New York Quotations

Following are the New York spot quotations, for one year and one month ago, and November 23, the current date:

	December 1, 1920	November 1, 1921	November 23, 1921
Plantation Hevea			
First, latex crêpe	$0.19 @	$0.16¼@.16¾	$0.18¾@
Off latex crêpe	@	.16 @	.18 @
Amber crêpe No. 1	.16½@	.16 @	.18 @
Amber crêpe No. 2	.15½@	.15 @	.17½@
Amber crêpe No. 3	.14½@	.14½@	.18 @
Brown crêpe, thick and thin	.15 @	.15¼@	.17½@
Brown Crêpe, specky	.14½@.15	.14½@	.16½@
Brown crêpe, rolled	.14 @	.13½@	.15½@
Smoked sheet, ribbed	.17½@	.16¾@	.18¾@
Smoked sheet, plain	.16 @	@	@
Unsmoked sheet	.15 @	@	@
Colombo scrap No. 1	.13 @	.13 @	*.13½@
Colombo scrap No. 2	.12 @	.12 @	*.12½@
East Indian			
Assam crêpe	@	@	@
Assam onions	@	@	@
Penang block scrap	@	@	@
Pontianak			
Banjermassin	.07½@	.07 @	.08¼@
Palembang	.08 @	@	@
Pressed block	.15½@	.11½@	.11¾@
Sarawak	.07 @	.06 @	.06½@
South American			
Paras			
Upriver, fine	.20 @.21	.21½@.21¾	.24 @
Upriver, medium	.17 @	.18½@.19½	.21½@
Upriver, coarse	.15½@	.12 @	@
Upriver, weak, fine	.15 @.16	.18 @	.20 @
Islands, fine	.19½@	.20 @.21	.20½@
Islands, medium	*.14 @	.18 @	.18½@
Islands, coarse	.14 @	.10 @.11	.10½@
Cametá	.14 @	*.10 @	.09½@.10½
Acre Bolivian, fine	.20 @.21½	.21½@.22	.24 @.24½
Madeira, fine	.24 @.25	.23½@.24	.25 @.25½
Beni Bolivian	@	.21½@.22	.24 @.24½
Peruvian, fine	.18 @.19	.19 @.20	.22½@.23½
Tapajos, fine	.19 @	.19½@.20½	.21½@.22½
Caucho			
Upper caucho ball	.16 @.16½	.11¾@	.14 @
Lower caucho ball	.10 @.10½	.10½@	.11½@.12½

	December 1, 1920	November 1, 1921	November 23, 1921
Manicobas			
Ceará negro heads	$0.14 @	*$0.10 @	*$0.12 @
Ceará scrap	.06 @	*.08 @	*.08 @
Manicoba, 30% guaranty	.11 @	*.10 @	.09 @
Mangabeira thin sheet	.18 @	*.12 @	.15 @
Centrals			
Corinto scrap	.12 @	.08 @.11	.13½@.14½
Central scrap	.12 @	.08 @.11	.13½@.14½
Central scrap and strip	.10 @	.07 @.09	.12½@.13½
Central wet sheet	.07 @	.04 @	.04½@.05½
Esmeralda sausage	.12 @	.08 @.11	.13½@.14½
Guayule, 20% guaranty	*.20 @	@	@
Guayule washed and dried	*.30 @	.25 @	.25 @.25½
Africans			
Benguela, No. 1, 28½%.	@	@	@
Benguela, No. 2, 32½%.	.09 @	.06 @	@
Conakry niggers	@	@	@
Congo prime, black upper	@	@	@
Congo prime, red upper	@	@	@
Kassai, black	@	@	@
red	@	@	@
Massai sheets and strings	@	@	@
Niger flake, prime	@	@	@
Rio Nunez ball	@	@	@
Rio Nunez sheets, stringy	@	@	@
Gutta Percha			
Gutta Siak	.17 @.18	.16 @.16½	.16¼@.17
Red Macassar	2.50 @2.90	2.75 @	2.75 @2.80
Balata			
Block, Ciudad Bolivar	.70 @	.54 @.55	.58 @.59
Colombia	.47 @.48	.45 @.47	.48 @.48½
Panama	@	.45 @.47	.47 @.47½
Surinam sheet	.72 @.73	.64 @.66	.71 @.71½
amber	.80 @	.69 @.70	.74 @.74½

*Nominal

Reclaimed Rubber

The market for reclaimed rubber remains substantially stationary as regards price. There has been some curtailment of demand due to the approach of the inventory season, although the buying which is of a hand-to-mouth character has shown increased activity. Reclaimers generally are operating their plants at 35 to 50 per cent capacity. The quotations below are nominal.

New York Quotations

November 23, 1921
Prices subject to change without notice.

Standard Reclaims			
Floating	$0.12	@	$0.13
Friction	.12	@	.13
Mechanical	.09	@	.11
Shoe	.10½	@	.11
Tires, auto	.10½	@	.11
truck	.09	@	.11
White	.13	@	.14

Comparative Low and High New York Spot Rubber Prices

	November 1921*			November 1920			November 1919		
Plantations									
First latex crêpe	$0.16	@	$0.19	$0.18½	@	$0.21½	$0.53	@	$0.54½
Smoked sheet, ribbed	.16	@	.19	.17½	@	.20	.52	@	.54
Paras									
Upriver, fine	.22	@	.24½	.20½	@	.23¼	.49	@	.52
Upriver, coarse	.12	@	.14½	.14½	@	.15½	.34½	@	.35
Islands, fine	.20¼	@	.22½	.18½	@	.20	.48	@	.48½
Islands, coarse	.09	@	.16¼	.14	@	.14½	.21½	@	.23½
Cametá	.10	@	.11½	.13	@	.14½	.23	@	.23

*Figured to November 25, 1921.

Plantation Rubber Exports from Malaya

(These figures include the production of the Federated Malay States, but not of Ceylon.)

	January 1 to August 31, 1921			January 1 to October 6, 1921	
	Singapore	Malacca	Penang	Port Swettenham	Totals
To United Kingdom, *pounds*	34,540,065	2,802,253	13,857,432	13,971,536	65,171,286
The Continent	7,444,090	1,739,485	177,566	169,292	9,530,433
Japan	29,599,271	.....	.....	37,575	29,636,846
Ceylon	44,627	.....	214,865	477,656	737,148
United States and Canada	101,985,952	15,640	2,547,833	.....	104,549,425
Australia	633,548	806	.....	.....	634,354
Other countries	39,746	.....	800,233	.....	839,979
Totals, *pounds*	174,287,299	4,558,184	17,597,929	14,656,059	211,099,471

Compiled by Barlow & Co., Singapore.

Amsterdam Rubber Market

JOOSTEN & JANSSEN, Amsterdam, report under date of November 4, 1921:

This week prices reacted a little at first but soon recovered again. The turnover was unimportant as sellers mostly held for too high prices. There constantly was good demand, however, especially for lower grades spot, and for shipment from the East during several months. Generally there was again preference for sheets above crêpe. The close was the same as last week.

Hevea crêpe and sheets, Fl. .52½ Spot.
Hevea crêpe and sheets, Fl. .54½ January to March.
Hevea crêpe and sheets, Fl. .56½ April to June.

Singapore Rubber Market

GUTHRIE & CO., Limited, Singapore, report under date of October 6, 1921:

The quantity catalogd for the weekly rubber auction yesterday—858 tons—was the heaviest for some time past and precluded serious competition among buyers to the extent that values did not appreciate in accordance with a much firmer demand.

Standard sheet sold at 30½-31 cents, but the bulk of this grade was withdrawn and disposed of in the outside market, where better prices were obtainable. Good F. A. Q. sheet was readily taken up at 29-30½ cents. Off quality lots were steady at last week's prices. Standard pale crêpe continues at a discount compared with sheet. The highest obtained for this grade was 29½ cents, good quality lots selling freely at 28-29 cents. Scrap grades were in exceptionally good demand, and, although values show little change, the general average of prices was much srtonger. The sale closed firm with a tendency to higher values; 653 tons were sold. The following is the course of values:

	In Singapore per pound			Sterling Equivalent per pound in London		
Sheet, fine ribbed smoked	30½	@	31	—/10¾	@	—/10½
Sheet, good F. A. Q.	29	@	30½	—/10	@	—/10¼
Sheet, off quality	23	@	28½	—/ 8¼	@	—/ 9¾
Crêpe, fine pale	29½	@		—/10¾	@	
Crêpe, good pale	25	@	29	—/ 9⅛	@	—/10¼
Crêpe, off quality	22	@	25	—/ 8¼	@	—/ 9⅛
Crêpe, fine brown	22	@	24	—/ 8¼	@	—/ 8⅝
Crêpe, good brown	17	@	21½	—/ 6⅞	@	—/ 8⅛
Crêpe, dark	17½	@	21½	—/ 7	@	—/ 8⅛
Crêpe, bark	17	@	18	—/ 6⅞	@	—/ 7¼

Plantation Rubber Exports from Java*

	August		Eight months ended August 31	
	1920	1921	1920	1921
To Netherlands *kilos*	524,000	372,000	3,133,000	4,348,000
Great Britain	392,000	424,000	5,106,000	6,072,000
Germany	10,000	103,000	69,000	354,000
United States	400,000	1,628,000	9,505,000	5,734,000
Singapore	299,000	169,000	2,950,000	1,807,000
Japan	.....	5,000	184,000	108,000
Australia	27,000	.....	190,000	211,000
Other countries	17,000	9,000	42,000	60,000
Totals *kilos*	1,669,000	2,710,000	21,179,000	18,694,000
Ports of origin:				
Tandjong Priok *kilos*	738,000	1,297,000	9,923,000	8,427,000
Samarang	23,000	17,000	303,000	317,000
Scerabaya	785,000	1,363,000	10,249,000	8,494,000

*The July figures are verified.

New York Average Spot Rubber Prices

PRICES IN CENTS PER POUND

	October, 1921																			November, 1921				
	10	11	12*	13	14	15	17	18	19	20	21	22	24	25	26	27	28	29	31	1	2	3	4	5
PLANTATIONS																								
Sheet																								
Ribbed smoked	15⅛	15⅛	....	16⅛	16⅛	16⅜	17¼	16⅝	16⅜	16⅝	16⅜	16¼	16¼	16¾	16⅜	16⅝	16⅜	16⅛	16⅜	16⅜	16⅜	16⅞	16⅞	16⅞
Crêpe																								
First latex	15⅜	15¼	....	16	16⅛	16⅜	17⅛	16⅝	16⅞	16¾	16⅜	16	16	16⅜	16⅝	16⅝	16⅛	16⅛	16¼	16¾	16⅝	16¾	16¾	16¾
Off latex	14⅛	14⅛	....	14¾	14⅞	15⅛	16	15⅜	15⅞	15¾	15¾	14¾	15¼	15⅝	15¾	16	15½	15½	15½	15¾	15¾	16	15⅞	15⅞
No. 1 blanket	14⅜	14⅜	....	14⅜	14½	15¼	15¾	15½	15¾	15½	15¼	16	15½	15⅝	15⅞	16	15¾	15¾	15½	15¾	15½	15¾	15¾	15¾
No. 2 blanket	13⅜	13⅜	....	13⅝	13¾	14¼	15	14⅝	14¾	15	14¾	15	14½	14½	14⅞	15¼	14⅞	14⅞	15	15¼	15	15¼	15¼	15¼
No. 3 blanket	12½	12½	....	12⅝	13⅛	13¾	14	13¾	14⅛	14¼	14	14	13¾	14⅞	14½	14½	14¼	14¼	14⅜	14⅜	14½	14¾	14¾	14¾
Thin, clean, brown	13½	13½	....	13½	13½	13¾	14¾	14½	14½	14½	14¼	14½	14¼	14¾	14¾	14¾	14¾	14¾	14¾	14¾	14¾	15	14¾	14¾
Specky brown	12½	12½	....	12½	12½	13¼	14	13½	13¾	13½	13¼	12½	12¾	13¼	13½	14¼	13⅞	13⅞	13¾	13¾	14⅛	14¼	14	14
Rolled brown	11¾	11¾	....	12⅛	12⅛	12¼	13	12¾	12¾	12⅞	12⅞	12¾	12¾	12¾	12¾	12⅞	12¾	12¾	12¾	12¾	13	13¼	13¼	13¼

*Holiday.

United States Crude and Waste Rubber Imports for 1921 (by Months)

1921	Plantation	Parás	Africans	Centrals	Guayule	Manicoba and Matto Grosso	Balata	Miscellaneous	Waste	Totals 1921	Totals 1920
January *tons*	12,819	1,312	43	3	.....	.....	41	173	1,071	15,462	22,401
February	7,913	432	269	2	25	.....	25	216	37	8,919	33,984
March	12,241	1,794	377	1	.....	3	29	7	345	14,797	33,998
April	16,861	403	....	5	.....	.....	64	226	7	17,566	24,957
May	9,127	1,570	....	2	33	.....	40	186	41	10,999	28,666
June	12,361	1,091	....	25	.....	.....	49	203	72	13,801	15,606
July	11,140	495	27	30	.....	.....	25	189	34	11,940	17,487
August	13,031	899	41	3	.....	.....	21	102	22	14,119	15,066
September	14,553	416	15	4	.....	.....	41	211	99	15,439	12,414
October	21,602	990	874	3	.....	.....	45	400	17	23,931	11,595
Totals, 10 months, 1921 *tons*	131,748	9,402	1,646	78	58	3	380	1,913	1,745	146,973	.....
Totals, 10 months, 1920	181,561	16,586	3,783	690	957	35	471	8,086	4,005	.....	216,174

Compiled by The Rubber Association of America, Inc.

Ceylon Rubber Exports

	January 1 to September 22	
	1920	1921
To United Kingdom.....pounds	31,362,120	22,150,891
Austria	.....	980
Belgium	169,550	254,384
France	590,934	317,900
Germany	198,115	2,750,863
Holland	22,558	374,281
Denmark	.....	51,610
Italy	112,000	104,160
Norway	.....	2,240
Western Australia.....	56	.....
Victoria	197,236	127,390
New South Wales	361,972	115,000
United States.....	27,934,832	36,313,518
Canada and Newfoundland.....	425,600	419,148
India	736	9,366
Straits Settlements.....	44,800	.....
Japan	159,925	303,696
Totals.....	61,580,434	63,295,427

Compiled by the Ceylon Chamber of Commerce.

Straits Settlements Rubber Exports

An official report from Singapore states that 10,794 tons of plantation rubber were exported from Straits Settlements ports in the month of September, as compared with 7,939 tons in August and 9,791 tons in the corresponding month last year. Transhipments amounted to 1,203 tons. The total export for nine months was 73,243 tons as against 100,720 tons in 1920 and 109,952 tons in 1919. Appended are the comparative statistics:

	1919	1920	1921
January .....tons	14,404	13,125	5,809
February	15,661	17,379	5,813
March	20,908	5,931	7,275
April	10,848	9,768	6,091
May	15,845	15,617	8,813
June	5,059	11,663	10,111
July	7,818	10,773	10,598
August	8,933	6,673	7,939
September	10,476	9,791	10,794
Totals .....tons	109,952	100,720	73,243

These figures include transhipments of rubber from various places in the neighborhood of the Straits Settlements, such as Borneo, Java, Sumatra and the non-Federated Malay States, as well as rubber actually exported from the colony, but *do not* include rubber exports from the Federated Malay States.

London and Liverpool Crude Rubber Imports and Exports

	Week Ended			
1921	Oct. 8	Oct. 15	Oct. 22	Oct. 29
Imports—London:				
Ceylon .....tons	199	218	228	383
Straits	187	445	1,436	1,106
British India.....	3	1	73	87
Java	6	124	13	173
Dutch East Indies.....	14	52	39	91
British North Borneo.....	....	....	63	20
Total .....tons	409	842	1,852	1,860
Exports—London:				
France .....tons	197	320	53	398
Belgium	2	10	34	3
Spain	15	1	....	4
Germany	325	133	76	326
Holland	409	71	76	122
Italy	14	48	138	40
New York	1,009	214	531	582
Montreal	....	14	....	....
Boston	....	10	....	....
Denmark	....	....	10	....
Norway	....	....	....	2
Total .....tons	1,871	821	918	1,477
Imports—Liverpool:				
British India .....tons	3	....	....	10
Dutch East Indies.....	3	....	....	....
Ceylon	45	....	....	35
Java	....	....	....	75
Total .....tons	51	....	....	120
Exports—Liverpool:				
Copenhagen .....tons	40	....	....	....
Hamburg	3	....	....	....
Helsingfors	2	....	....	....
France	....	7	....	....
Holland	....	1	....	....
Germany	....	6	....	....
Total .....tons	45	14	....	....
Newhaven exports to Dieppe:				
For France .....tons	40	....	65	....
Italy	5	....	....	....

Compiled by Lavington Bros., Limited, continental and colonial carriers, 68 & 69 Old Bailey, London, E. C. 4, England.

Federated Malay States Rubber Exports

An official report from Kuala Lumpur states that 9,649 tons of rubber were exported from the Federated Malay States in the month of September. This compares with 7,603 tons in August and 7,605 tons in the corresponding month last year. To the end of September exports amounted to 64,315 tons as against 80,263 tons in 1920 and 79,824 tons in 1919. Appended are the comparative statistics:

	1919	1920	1921
January .....tons	7,163	11,119	7,085
February	10,809	9,781	6,091
March	10,679	9,524	7,408
April	7,664	8,375	7,444
May	7,308	7,627	7,658
June	7,094	9,049	5,823
July	8,640	8,043	5,554
August	10,626	9,140	7,603
September	9,841	7,605	9,649
Totals .....tons	79,824	80,263	64,315

CRUDE RUBBER ARRIVALS AT ATLANTIC PORTS AS STATED BY SHIPS' MANIFESTS

Paras and Caucho at New York

	Fine	Medium	Coarse	Caucho	Totals Pounds
OCTOBER 25. By the S. S. "Delambre," from Manáos.					
General Rubber Co..	.....	.....	.....	.....	†33,600
General Rubber Co..	78,400	.....	.....	179,200	257,600
Various	.....	.....	.....	.....	261,622
OCTOBER 25. By the S. S. "Delambre," from Pará.					
G. Amsinck & Co...Inc	.....	.....	.....	.....	14,474
Arkell & Douglas, Inc.	.....	.....	.....	.....	32,560
Baring Brothers.....	.....	.....	.....	.....	10,877
Various	.....	.....	.....	.....	67,738
NOVEMBER 3. By the S. S. "Dunstan," from Pará.					
H. A. Astlett & Co..	78,400	6,700	8,900	53,700	147,700
Paul Bertuch.....	.....	.....	.....	112,404	112,404
Meyer & Brown, Inc.	47,040*	.....	.....	.....	47,040
NOVEMBER 3. By the S. S. "Dunstan," from Manáos.					
Paul Bertuch.....	101,437	2,008	8,272	426	112,143
NOVEMBER 3. By the S. S. "Dunstan," from Pará and Manáos.					
Poel & Kelly, Inc...	.....	.....	.....	.....	122,768
NOVEMBER 14. By the S. S. "Baltic," from Liverpool.					
Fred Stern & Co....	.....	.....	60,211	.....	60,211

†Cameta.
*Includes medium.

Plantations

(Figured at 180 pounds net to the bale or case.)

	Shipment from:	Shipped to:	Pounds	Totals
OCTOBER 22. By the S. S. "Noordam," at New York.				
Poel & Kelly, Inc.....	Rotterdam	New York	562,500	
American Trading Co...	Rotterdam	New York	1,043,820	
Fred Stern & Co.....	London	New York	52,361	
Stein, Hall & Co., Inc..	Rotterdam	New York	56,880	
Meyer & Brown, Inc....	Rotterdam	New York	190,400	
Baird Rubber & Trading Co., Inc.	Amsterdam	New York	112,000	
Various	Rotterdam	New York	142,039	2,160,000
OCTOBER 23. By the S. S. "City of Agra," at New York.				
Meyer & Brown, Inc....	Colombo	New York	78,400	
L. Littlejohn & Co., Inc.	Colombo	New York	134,400	
Whittall & Co., of Ceylon	Colombo	New York	61,200	
Charles T. Wilson Co., Inc.	Colombo	New York	42,840	
General Rubber Co.....	Colombo	New York	145,200	
Various	Colombo	New York	263,960	
Baird Rubber & Trading Co.	Singapore	New York	134,400	860,406
OCTOBER 25. By the S. S. "Albania," at New York.				
The Fisk Rubber Co....	Liverpool	Chicopee Falls	39,960	39,960
OCTOBER 26. By the S. S. "Saxonia," at New York.				
Various	London	New York	17,280	17,280
OCTOBER 26. By the S. S. "Huftero," at New York.				
Poel & Kelly, Inc.....		New York	235,600	235,600
OCTOBER 26. By the S. S. "Arcturus," at New York.				
Poel & Kelly, Inc.....	Colombo	New York	147,000	
Baird Rubber & Trading Co.	Colombo	New York	112,000	
Various	Colombo	New York	528,360	
H. A. Astlett & Co.....	Soerabaya	New York	56,000	
William H. Stiles & Co..	Singapore	New York	190,460	
Thomas A. Desmond & Co.	Singapore	New York	138,240	
Fred Stern & Co.....	Singapore	New York	175,627	
F. R. Henderson & Co..	Singapore	New York	763,920	
Charles T. Wilson Co., Inc.	Singapore	New York	130,140	
L. Littlejohn & Co., Inc.	Singapore	New York	492,800	
Manhattan Rubber Manufacturing Co.....	Batavia	New York	18,720	
John D. Lewis.....	Batavia	New York	59,940	
Firestone Tire & Rubber Co.	Batavia	Akron	171,900	
Various	Batavia	New York	306,553	3,291,660

Plantations—*Continued*

	Shipment from:	Shipped to:	Pounds	Totals
OCTOBER 27. By the S. S. "Vellavia," at New York.				
Charles T. Wilson Co., Inc.	London	New York	6,480	
Meyer & Brown, Inc.	London	New York	224,000	
Jaeger & Co.	London	New York	128,700	
East Asiatic Co., Inc.	London	New York	96,300	
Arbuthnot & Latham	London	New York	32,760	
A. Latham & Co.	London	New York	198,180	
L. Littlejohn & Co., Inc.	London	New York	112,000	
Poel & Kelly, Inc.	London	New York	209,700	
Various	London	New York	446,100	1,454,220
OCTOBER 30. By the S. S. "Westerdyk," at New York.				
John D. Lewis	Rotterdam	New York	123,840	
International Products Co.	Rotterdam	New York	36,180	
Baring Brothers	Rotterdam	New York	201,960	
Goldman, Sacks & Co.	Rotterdam	New York	52,020	
Meyer & Brown, Inc.	Rotterdam	New York	56,000	
Various	Rotterdam	New York	888,633	
Fred Stern & Co.	London	New York	9,297	
Hood Rubber Co.	London	Watertown	67,390	1,435,320
OCTOBER 30. By the S. S. "Montauk," at New York.				
Continental Rubber Co. of New York	London	New York	104,940	
Charles T. Wilson Co., Inc.	London	New York	119,160	
L. Littlejohn & Co., Inc.	London	New York	226,420	
A. Latham & Co.	London	New York	4,140	
Various	London	New York	432,380	887,040
OCTOBER 30. By the S. S. "Clan Robertson," at Boston.				
Hood Rubber Co.	Colombo	Watertown	56,020	56,020
OCTOBER 30. By the S. S. "Clan Robertson," at New York.				
Baird Rubber & Trading Co.	Singapore	New York	33,600	
L. Littlejohn & Co., Inc.	East Indies	New York	145,600	
Fred Stern & Co.	Colombo	New York	59,800	239,000
OCTOBER 30. By the S. S. "Atreus," at New York.				
Poel & Kelly, Inc.	Singapore	New York	139,800	
J. T. Johnstone & Co.	Singapore	New York	39,600	
H. Muehlstein & Co.	Singapore	New York	1,260	
Baird Rubber & Trading Co.	Singapore	New York	201,600	
John D. Lewis	Singapore	New York	81,000	
Edward Boustead & Co.	Singapore	New York	32,400	
William H. Stiles & Co.	Singapore	New York	112,000	
L. Littlejohn & Co., Inc.	Singapore	New York	179,200	
Schafer & Meyer	Singapore	New York	50,400	
H. P. Winter & Co.	Singapore	New York	18,000	
Habicht & Co.	Singapore	New York	75,600	
Meyer & Brown, Inc.	Singapore	New York	250,880	
General Rubber Co.	Singapore	New York	806,400	
Charles T. Wilson Co., Inc.	Singapore	New York	235,440	
Aldens' Successors, Inc.	Singapore	New York	36,000	
American Trading Co.	Singapore	New York	120,780	
Continental Rubber Co. of New York	Singapore	New York	80,640	
Pennsylvania Rubber Co. of New York	Singapore	Jeannette	67,140	
Various	Singapore	New York	1,695,040	
Aldens' Successors, Inc.	Pt. Sw't'nh'm	New York	15,480	
Various	Pt. Sw't'nh'm	New York	77,040	
J. T. Johnstone & Co.	Malacca	New York	118,800	
Irwin-Harrisons Crosfield, Inc.	Deli-Belawan	New York	252,900	
Various	Deli-Belawan	New York	145,800	
Irwin-Harrisons Crosfield, Inc.	Telok-Anson	New York	68,940	
Edward Boustead & Co.	Penang	New York	116,640	
Various	Penang	New York	40,320	
Baird Rubber & Trading Co.	Colombo	New York	144,540	
General Rubber Co.	Colombo	New York	336,000	
Thornett & Fehr, Inc.	Colombo	New York	360	
Meyer & Brown, Inc.	Colombo	New York	112,000	5,652,000
NOVEMBER 3. By the S. S. "Vasconia," at New York.				
L. Littlejohn & Co., Inc.	London	New York	280,000	
Poel & Kelly, Inc.	London	New York	71,245	
Various	London	New York	423,295	774,540
NOVEMBER 4. By the S. S. "Rotterdam," at New York.				
Meyer & Brown, Inc.	Rotterdam	New York	67,200	
L. Littlejohn & Co., Inc.	Rotterdam	New York	89,600	
Various	Rotterdam	New York	518,360	
Fred Stern & Co.	London	New York	66,980	742,140
NOVEMBER 4. By the S. S. "Havre Maru," at New York.				
Poel & Kelly, Inc.	Singapore	New York	452,000	
Habicht & Co.	Singapore	New York	20,160	
Thornett & Fehr, Inc.	Singapore	New York	325,980	
L. Littlejohn & Co., Inc.	Singapore	New York	672,000	
Baird Rubber & Trading Co.	Singapore	New York	112,000	
Fred Stern & Co.	Singapore	New York	88,981	
Various	Singapore	New York	81,700	
Hood Rubber Co.	London	Watertown	33,600	1,786,421
NOVEMBER 5. By the S. S. "Montana," at New York.				
Fred Stern & Co.	London	New York	44,881	
Various	London	New York	1,182,719	1,227,600
NOVEMBER 13. By the S. S. "Vardula," at New York.				
Michelin Tire Co.	London	Milltown	30,420	
Thornett & Fehr, Inc.	London	New York	292,500	
C. H. Fauvice & Co.	London	New York	114,300	
L. Littlejohn & Co., Inc.	London	New York	481,600	918,800
NOVEMBER 10. By the S. S. "Mississippi," at Boston.				
Hood Rubber Co.	London	Watertown	22,366	22,366
NOVEMBER 11. By the S. S. "Hakodate Maru," at New York.				
General Rubber Co.	Colombo	New York	176,400	
L. Littlejohn & Co., Inc.	Colombo	New York	179,200	
Baird Rubber & Trading Co., Inc.	Colombo	New York	11,200	
Meyer & Brown, Inc.	Colombo	New York	56,000	
J. T. Johnstone & Co., Inc.	Colombo	New York	4,480	
Various	Colombo	New York	76,360	503,640
NOVEMBER 11. By the S. S. "Menominee," at New York.				
Continental Rubber Co. of New York	London	New York	1,440	
L. Littlejohn & Co., Inc.	London	New York	127,616	
Various	London	New York	161,824	745,204
NOVEMBER 11. By the S. S. "City of Karachi," at New York.				
General Rubber Co.	Colombo	New York	134,400	
Baring Brothers	Colombo	New York	11,880	
Baird Rubber & Trading Co., Inc.	Singapore	New York	56,000	
Various	Colombo	New York	264,760	467,040
NOVEMBER 11. By the S. S. "City of Karachi," at Boston.				
Hood Rubber Co.	Colombo	Watertown	11,220	11,220
NOVEMBER 12. By the S. S. "Ryndam," at New York.				
Poel & Kelly, Inc.	Rotterdam	New York	89,400	
L. Littlejohn & Co., Inc.	Rotterdam	New York	268,800	
Various	Rotterdam	New York	1,103,220	1,461,420
NOVEMBER 13. By the S. S. "New Britain," at New York.				
L. Littlejohn & Co., Inc.	Rotterdam	New York	495,000	
Habicht & Co.	Rotterdam	New York	14,938	
Thornett & Fehr, Inc.	Rotterdam	New York	34,650	
A. C. Spencer Hess	East	New York	36,190	580,778
NOVEMBER 14. By the S. S. "Java," at New York.				
H. A. Astlett & Co.	Soerabaya	New York	22,000	
Fred Stern & Co.	Soerabaya	New York	11,247	
Various	Soerabaya	New York	107,613	
L. Littlejohn & Co., Inc.	Amsterdam	New York	224,000	364,860
NOVEMBER 14. By the S. S. "Eastern Soldier," at New York.				
Chas. T. Wilson Co., Inc.	Rotterdam	New York	9,328	9,328
NOVEMBER 14. By the S. S. "Bellflower," at New York.				
Various	Shanghai	New York	222,480	222,480
NOVEMBER 14. By the S. S. "City of Newcastle," at New York.				
Baird Rubber & Trading Co., Inc.	Colombo	New York	11,200	
General Rubber Co.	Colombo	New York	336,000	
L. Littlejohn & Co., Inc.	Colombo	New York	201,600	
Meyer & Brown, Inc.	Colombo	New York	280,000	
J. T. Johnstone & Co., Inc.	Colombo	New York	20,185	
Poel & Kelly, Inc.	Colombo	New York	22,400	871,385
NOVEMBER 14. By the S. S. "Kabinga," at Boston.				
H. A. Astlett & Co.	Singapore	New York	56,000	
Hood Rubber Co.	Singapore	Watertown	89,750	145,750
NOVEMBER 14. By the S. S. "Kabinga," at New York.				
H. A. Astlett & Co.	Singapore	New York	504,000	
Hood Rubber Co.	London	Watertown	2,240	
Firestone Tire & Rubber Co.	Singapore	Akron	152,100	
Fred Stern & Co.	Singapore	New York	235,295	
William H. Stiles & Co.	Singapore	New York	168,000	
Eastern Rubber Co.	Singapore	New York	433,440	
Habicht & Co.	Singapore	New York	237,060	
East Asiatic Co., Inc.	Singapore	New York	236,880	
J. T. Johnstone & Co.	Singapore	New York	207,362	
L. Littlejohn & Co., Inc.	Singapore	New York	526,400	
Charles T. Wilson Co., Inc.	Singapore	New York	90,000	
H. Muehlstein & Co.	Singapore	New York	153,360	
Aldens' Successors, Inc.	Singapore	New York	26,280	
Baird Rubber & Trading Co.	Singapore	New York	280,000	
Jaeger & Co.	Singapore	New York	123,660	
General Rubber Co.	Singapore	New York	1,792,000	
Meyer & Brown, Inc.	Singapore	New York	584,640	
Thornett & Fehr, Inc.	Singapore	New York	1,800	
Poel & Kelly, Inc.	Singapore	New York	488,800	
Various	Singapore	New York	532,873	
Various	Malacca	New York	563,940	
Various	Pt. Sw't'nh'm	New York	195,300	
Various	Teluk Anson	New York	66,780	
Various	Belawan-Deli	New York	210,240	
Various	Colombo	New York	310,200	
Meyer & Brown, Inc.	Colombo	New York	134,400	8,257,050

Plantations—*Continued*

Shipment from:	Shipped to:	Pounds	Totals
NOVEMBER 15. By the S. S. "Bolton Castle," at New York.			
William H. Stiles & Co.	Singapore	New York	89,600	
J. T. Johnstone & Co., Inc.	Singapore	New York	95,850	
Fred Stern & Co.	Singapore	New York	100,800	
Meyer & Brown, Inc.	Singapore	New York	145,600	
Baird Rubber & Trading Co.	Singapore	New York	112,000	
L. Littlejohn & Co., Inc.	East	New York	1,086,400	
Hood Rubber Co.	London	Watertown	33,600	1,663,850
NOVEMBER 16. By the S. S. "Sumatra Maru," at New York.			
William H. Stiles & Co.	Singapore	New York	56,000	
L. Littlejohn & Co., Inc.	Singapore	New York	526,400	
Baird Rubber & Trading Co.	Singapore	New York	56,000	
Raw Products Co.	Singapore	New York	45,000	
Various	Singapore	New York	213,900	897,300
NOVEMBER 16. By the S. S. "Half Moon," at New York.			
H. A. Astlett & Co.	Batavia	New York	89,600	
Baird Rubber & Trading Co.	Singapore	New York	22,400	
Fred Stern & Co.	Singapore	New York	71,309	
General Rubber Co.	Telok Niboeng	New York	829,000	
L. Littlejohn & Co., Inc.	Java	New York	1,344,400	
Meyer & Brown, Inc.	Medan	New York	210,560	
Poel & Kelly, Inc.		New York	609,900	3,177,169
NOVEMBER 17. By the S. S. "West Calera," at Los Angeles.			
H. A. Astlett & Co.	Singapore	New York	56,000	56,000
NOVEMBER 17. By the S. S. "Takaoka Maru," at New York.			
J. T. Johnstone & Co., Inc.	Singapore	New York	136,200	
L. Littlejohn & Co., Inc.	Java	New York	156,800	
Various	Batavia	New York	403,060	696,060
NOVEMNER 17. By the S. S. "Celtic Prince," at New York.			
J. T. Johnstone & Co., Inc.	Singapore	New York	49,060	49,060

Balata

OCTOBER 25. By the S. S. "Delambre," at New York.				
Various	Manaos	New York	29,460	29,460
NOVEMBER 1. By the S. S. "Elmac," at New York.				
Middleton & Co., Limited	St. Laurent	New York	18,300	
F. R. Davison & Co.	St. Laurent	New York	17,550	
Various	St. Laurent	New York	3,600	39,450
NOVEMBER 3. By the S. S. "Dunsla," at New York.				
Various	Pará	New York	9,150	9,150
NOVEMBER 4. By the S. S. "Tivives," at New York.				
P. R. Rincones, Jr., Co.	Cartegena	New York	5,550	5,550
NOVEMBER 7. By the S. S. "Majura," at New York.				
American Trading Co.	Port of Spain	New York	600	600
NOVEMBER 9. By the S. S. "Quillota," at New York.				
American Trading Co.	Guayaquil	New York	2,700	2,700
NOVEMBER 16. By the S. S. "General Ernst," at New York.				
Ultramares Corporation.	Buenaventura	New York	7,300	7,300

Pontianak

OCTOBER 26. By the S. S. "Arcturus," at New York.				
Various	Singapore	New York	75,900	75,900
OCTOBER 30. By the S. S. "Atreus," at New York.				
L. Littlejohn & Co., Inc.	Singapore	New York	36,000	
Fred Waterhouse Co.	Singapore	New York	16,200	52,200
NOVEMBER 4. By the S. S. "Havre Maru," at New York.				
L. Littlejohn & Co., Inc.	Singapore	New York	14,400	
Various	Singapore	New York	23,400	37,800
NOVEMBER 14. By the S. S. "Kabinga," at New York.				
L. Littlejohn & Co., Inc.	Singapore	New York	55,500	55,500

Africans

OCTOBER 26. By the S. S. "Clontarf," at New York.				
Various	Africa	New York	8,688	8,688
OCTOBER 30. By the S. S. "Port de Boulogne," at New York.				
Various	St. Nazaire	New York	1,932,443	1,932,443
NOVEMBER 7. By the S. S. "Finland," at New York.				
Various	Antwerp	New York	7,820	7,820
NOVEMBER 10. By the S. S. "Phoebus," at New York.				
Thurston & Braidich	Marseilles	New York	2,300	2,300
NOVEMBER 14. By the S. S. "Croxton Hall," at New York.				
Various	Antwerp	New York	18,198	18,198
NOVEMBER 13. By the S. S. "Vardula," at New York.				
Various	London	New York	1,810,000	1,810,000

Centrals

Shipment from:	Shipped to:	Pounds	Totals
OCTOBER 30. By the S. S. "General W. C. Gorgas," at New York.			
G. Amsinck & Co., Inc.	Cristobal	New York	3,600	
Pablo Calvet & Co.	Cristobal	New York	3,150	6,750
NOVEMBER 14. By the S. S. "General G. W. Goethals."			
G. Amsinck & Co., Inc.	Cristobal	New York	750	750

Gutta Percha

OCTOBER 26. By the S. S. "Arcturus," at New York.				
Baring Bros.	Singapore	New York	50,400	50,400

CUSTOM HOUSE STATISTICS

New York

Imports

	September 1920 Pounds	September 1920 Value	September 1921 Pounds	September 1921 Value
UNMANUFACTURED—*free*				
Crude rubber				
From Belgium	.....	.....	11,200	$844
Netherlands	307,383	$141,036	1,362,870	221,670
England	947,073	338,454	5,123,590	744,497
Nicaragua	1,584	432	.....	.....
Panama	150	46	.....	.....
Argentina	3,010	1,241	.....	.....
Brazil	1,509,440	410,832	1,535,785	165,565
Colombia	10,469	3,704	4,712	1,350
Ecuador	2,700	886	.....	.....
Peru	233,993	60,835	65,816	6,979
Uruguay	24,613	6,923	.....	.....
Venezuela	94,841	24,236	.....	.....
China	197,527	167,110	.....	.....
British India	67,200	25,290	41,468	20,251
Straits Settlements	11,956,859	4,584,403	14,706,894	2,108,118
British East Indies	2,218,726	725,342	5,752,420	676,835
Dutch East Indies	5,253,661	2,122,969	5,024,109	684,696
Hongkong	11,200	6,000	.....	.....
Japan	238,042	85,957	.....	.....
Australia	36,707	15,784	.....	.....
Philippine Islands	12,500	5,000	.....	.....
Belgian Kongo	103,518	23,809	.....	.....
British East Africa	3,174	696	.....	.....
Totals	23,234,370	$8,750,985	33,628,864	$4,630,805
Balata	894,115	380,143	218,102	123,890
Jelutong (Pontianak)	466,480	72,155	250,306	14,849
Gutta percha	308,389	51,207	166,170	22,419
Totals	24,903,354	$9,254,490	34,263,442	$4,791,963
Rubber scrap and reclaimed	497,303	25,266	62,744	5,122
Totals, unmanufactured	25,400,657	$9,279,756	34,326,186	$4,797,085
Manufactures of rubber and gutta percha—*dutiable*	.....	$90,664	.....	$62,382
Chicle—*dutiable*	241,994	162,007	128,445	69,280

Exports

MANUFACTURED				
Automobile and other tires	.....	$2,750,487	.....	$837,865
Inner tubes	.....	274,333	.....	76,595
Belting, hose, and packing	.....	365,887	.....	131,387
Rubber boots and shoes, *pairs*	545,982	552,216	236,592	254,242
Soles and heels	.....	34,503	.....	27,640
Druggists' sundries	.....	89,711	.....	39,127
Other rubber manufactures	.....	273,937	.....	193,392
Totals, manufactured	.....	$4,341,074	.....	$1,560,248
Insulated wire	.....	$515,831	.....	$246,012
UNMANUFACTURED—*free*				
Rubber scrap and reclaimed	219,941	$32,843	144,381	$6,315

Foreign Exports

Crude rubber	803,250	$284,717	.....	.....
Balata	17,920	13,762	122,650	$36,324
Rubber scrap and reclaimed	1,630	425	.....	.....
Rubber manufactures	.....	2,017	.....	1,425

Massachusetts

Imports

UNMANUFACTURED—*free*				
Crude rubber				
From British India	12,640	$2,600	.....	.....
Straits Settlements	14,000	5,649	.....	.....
British East Indies	140,120	36,433	313,940	$29,569
Totals	166,760	$44,682	313,940	$29,569
Rubber scrap and reclaimed	21,274	1,082	.....	.....
Totals, unmanufactured	188,034	$45,764	313,940	$29,569
Rubber manufactures, *dutiable*	.....	$2,087	.....	$3,335

Exports

	September 1920 Pounds	September 1920 Value	September 1921 Pounds	September 1921 Value
MANUFACTURED				
Automobile and other tires	.....	$1,463	.....	$908
Inner tubes	.....	618	.....	3,144
Belting, hose, and packing	.....	4,926	.....	90
Rubber boots and shoes, *pairs*	199,753	200,993	6,444	8,805
Soles and heels	.....	2,006	.....	197
Druggists' sundries	.....	4,178	.....	100
Other rubber manufactures	.....	35,243	.....	25,514
Totals, manufactured	.....	$249,427	.....	$38,758
Insulated wire	.....	$8,416	.....	.....
Rubber scrap and reclaimed	.....	.....	1,017	$356

Buffalo

Imports

Rubber scrap and reclaimed	256,835	$11,192	150,000	$2,028
Rubber manufactures, *dutiable*	.....	7,520	.....	36,268

Exports

MANUFACTURED				
Automobile and other tires	.....	$36,253	.....	$7,245
Inner tubes	.....	2,372	.....	681
Belting, hose, and packing	.....	18,068	.....	5,783
Rubber boots and shoes, *pairs*	11,172	13,852	330	890
Druggists' sundries	.....	9,257	.....	3,471
Other rubber manufactures	.....	58,476	.....	39,278
Totals, manufactured	.....	$138,278	.....	$57,348
Insulated wire	.....	$659	.....	$4,934
Rubber scrap and reclaimed	445,238	60,392	63,365	5,969

Foreign Exports

Crude rubber	417,478	$104,464	1,018,730	$186,154
Rubber manufactures	.....	.....	.....	6,887
Chicle	.....	.....	463	215

Philadelphia

Imports

Rubber scrap and reclaimed	29,658	$3,109	.....	.....
Rubber manufactures, *dutiable*	.....	1,702	.....	$5,786

Exports

MANUFACTURED				
Automobile and other tires	.....	.....	.....	$6,946
Inner tubes	.....	.....	.....	802
Belting, hose, and packing	.....	.....	.....	1,982
Totals, manufactured	.....	.....	.....	$9,730
Insulated wire	.....	.....	.....	$244
Rubber scrap and reclaimed	.....	.....	67,663	2,385

New Orleans

Imports

UNMANUFACTURED—*free*				
Crude rubber				
From Nicaragua	2,390	$423	.....	.....
Totals, unmanufactured	2,390	$423	.....	.....
Rubber manufactures, *dutiable*	.....	.....	.....	$49
Chicle, *dutiable*	3,893	4,297	205	80

Exports

MANUFACTURED				
Automobile and other tires	.....	$224,810	.....	$3,174
Inner tubes	.....	47,256	.....	1,651
Belting, hose, and packing	.....	27,313	.....	3,876
Rubber boots and shoes, *pairs*	38,202	43,530	2,727	3,304
Soles and heels	.....	22,146	.....	253
Druggists' sundries	.....	353	.....	119
Other rubber manufactures	.....	12,407	.....	905
Totals, manufactured	.....	$377,815	.....	$13,282
Insulated wire	.....	$14,019	.....	$2,600

Foreign Exports

Balata	.....	.....	100	$30

Ohio

Imports

UNMANUFACTURED—*free*				
Crude rubber				
From Straits Settlements	2,935,245	$1,605,606	.....	.....
Total, unmanufactured	2,935,245	$1,605,606	.....	.....
Rubber manufactures, *dutiable*	.....	$85	.....	$542

Exports

MANUFACTURED				
Automobile and other tires	.....	$1,178	.....	$12,012
Inner tubes	.....	.....	.....	1,521
Belting, hose, and packing	.....	25	.....	.....
Other rubber manufactures	.....	1,703	.....	131
Totals, manufactured	.....	$2,906	.....	$13,664
Rubber scrap and reclaimed	40,394	$1,009	.....	.....

San Francisco

Imports

	September 1920 Pounds	September 1920 Value	September 1921 Pounds	September 1921 Value
UNMANUFACTURED—*free*				
Crude rubber				
From British India	22,440	$5,838	.....	.....
Straits Settlements	56,462	18,329	253,521	$33,318
Dutch East Indies	664,826	271,905	.....	.....
French East Indies	3,000	3,000	.....	.....
Hongkong	11,200	360	.....	.....
Japan	212,576	63,442	.....	.....
Totals	970,504	$362,874	253,521	$33,318
Jelutong (Pontianak)	.....	.....	150	17
Totals, unmanufactured	970,504	$362,874	253,671	$33,335
Rubber manufactures, *dutiable*	.....	$420	.....	1,373

Exports

MANUFACTURED				
Automobile and other tires	.....	$310,280	.....	$32,469
Inner tubes	.....	15,317	.....	1,632
Belting, hose, and packing	.....	125,869	.....	22,211
Rubber boots and shoes, *pairs*	3,546	7,644	4,091	4,319
Soles and heels	.....	11,947	.....	40
Druggist's sundries	.....	4,776	.....	2,758
Other rubber manufactures	.....	37,914	.....	9,962
Totals, manufactured	.....	$513,747	.....	$73,391
Insulated wire	.....	$9,621	.....	$2,735

Washington

Imports

UNMANUFACTURED—*free*				
Crude rubber				
From Straits Settlements	134,400	$39,071	128,780	$29,799
Japan	380,800	122,528	.....	.....
Dutch East Indies	.....	.....	44,136	4,837
Totals, unmanufactured	515,200	$161,599	172,916	$34,636
Rubber manufacture, *dutiable*	.....	$13,381	.....	$303

Exports

MANUFACTURED				
Automobile and other tires	.....	$123,834	.....	$19,506
Inner tubes	.....	4,166	.....	1,403
Belting, hose, and packing	.....	14,144	.....	1,683
Rubber boots and shoes, *pairs*	2,507	3,874	413	1,468
Soles and heels	.....	.....	.....	736
Druggists' sundries	.....	399	.....	125
Other rubber manufactures	.....	3,947	.....	2,201
Totals, manufactured	.....	$150,364	.....	$27,122
Insulated wire	.....	$565	.....	.....

Chicago

Imports

Rubber scrap and reclaimed	.....	.....	2,167	$17
Rubber manufactures, *dutiable*	.....	$16,096	.....	3,774
Chicle, *dutiable*	10,064	2,641	158,115	67,620

Michigan

Imports

Rubber scrap and reclaimed	.....	.....	31,028	$1,415
Rubber manufactures, *dutiable*	.....	$111,884	.....	2

Exports

MANUFACTURED				
Automobile and other tires	.....	$81,703	.....	$3,813
Inner tubes	.....	12,969	.....	107
Belting, hose, and packing	.....	4,261	.....	918
Rubber boots and shoes, *pairs*	4,379	15,832	2,528	8,270
Soles and heels	.....	19	.....	.....
Druggists' sundries	.....	543	.....	1,612
Other rubber manufactures	.....	13,951	.....	5,673
Totals, manufactured	.....	$129,278	.....	$20,393
Insulated wire	.....	$7,216	.....	$2,392
Rubber scrap and reclaimed	218,426	14,001	7,534	113

Imports of Crude Rubber Into the United States by Customs Districts

Customs Districts	October, 1921 Pounds	October, 1921 Value
Massachusetts	249,510	$23,378
Buffalo	3,825	174
New York	45,642,616	6,352,627
Maryland	559,977	168,861
Los Angeles	1,084,701	137,886
San Francisco	101,674	11,492
Totals	47,642,303	$6,694,418

EXPORTS OF INDIA RUBBER MANUFACTURES AND INSULATED WIRE AND CABLE FROM THE UNITED STATES BY COUNTRIES DURING THE MONTH OF JULY, 1921

EXPORTED TO—	Belting	Hose	Packing	Boots		Shoes		Soles and Heels	Automobile Tires				Druggists' Rubber Sundries	All Other Manufactures of Rubber	Totals	Insulated Wire and Cables
				Pairs	Value	Pairs	Value		Casings	Inner Tubes	Solid Tires	All Others				
EUROPE	Value	Value	Value					Value	Value	Value	Value	Value	Value	Value	Value	Value
Austria	.....	.....	.....	.....	.....	40	$50	.....	.....	.....	.....	.....	.....	.....	$50	.....
Azores and Madeira Islands	.....	$504	.....	.....	.....	.....	.....	.....	$360	.....	.....	.....	.....	.....	864	.....
Belgium	$520	82	$884	.....	.....	.....	.....	.....	196	$54	.....	.....	$484	$3,056	5,276	$261
Bulgaria	.....	1,701	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1,701	.....
Czechoslovakia	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	$15	.....	.....	15	.....
Denmark	815	.....	.....	.....	.....	6,440	4,343	.....	16,037	1,112	$65	.....	144	673	23,189	.....
Esthonia	.....	.....	1,400	.....	.....	10,000	25,000	.....	.....	.....	.....	.....	.....	.....	26,400	.....
Finland	497	211	.....	.....	.....	.....	.....	.....	263	27	636	655	.....	30	2,319	.....
France	12,011	2,130	74	.....	.....	3,192	2,035	.....	1,806	.....	.....	.....	1,307	37,728	57,091	3,488
Germany	.....	.....	.....	.....	.....	.....	.....	.....	119	.....	.....	.....	.....	4	123	.....
Gibraltar	.....	.....	.....	.....	.....	.....	.....	.....	30	125	.....	.....	.....	432	587	.....
Greece	.....	.....	.....	.....	.....	.....	.....	.....	2,128	133	.....	.....	.....	.....	2,261	.....
Iceland and Faroe Islands	.....	.....	.....	180	$519	.....	.....	.....	1,319	158	.....	.....	.....	.....	1,987	.....
Italy	.....	.....	.....	102	285	400	200	.....	1,018	200	.....	.....	.....	632	2,335	97
Netherlands	1,666	3,121	45	.....	.....	.....	.....	$125	10,544	1,345	175	.....	701	1,751	19,473	356
Norway	120	.....	.....	.....	.....	2,699	3,166	707	24,723	1,393	554	7,823	.....	262	38,748	4,801
Poland and Danzig	.....	.....	.....	.....	.....	8,432	6,156	.....	169	46	.....	.....	.....	.....	6,356	119,749
Portugal	.....	.....	.....	.....	.....	.....	.....	.....	453	80	.....	124	.....	.....	657	.....
Rumania	.....	.....	.....	.....	.....	2,400	2,402	.....	1,155	363	.....	.....	.....	.....	3,920	120
Spain	424	.....	159	.....	.....	.....	.....	357	4,456	119	3,417	67	192	5,276	14,467	1,358
Sweden	564	1,215	.....	.....	.....	120	180	492	60,757	1,727	287	.....	237	2,428	67,887	120,225
Switzerland	3,749	.....	.....	.....	.....	5,352	2,664	.....	1,234	79	.....	1,016	350	3,464	12,556	.....
Turkey in Europe	.....	.....	38	.....	.....	6,700	5,789	.....	.....	.....	1,328	.....	394	2,491	10,040	.....
England	1,397	2,123	3,224	487	1,675	5,040	3,425	204	440,633	35,349	10,755	64	10,867	93,832	603,548	12,679
Scotland	36	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	36	.....
Jugoslavia, Albania, etc	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1,000	1,000	.....
TOTALS, EUROPE	$21,799	$11,087	$5,824	769	$2,479	50,815	$55,410	$1,885	$567,382	$42,304	$17,217	$9,764	$14,676	$153,059	$902,886	$263,134
NORTH AMERICA																
Bermuda	.....	$53	$22	.....	.....	282	$496	$90	.....	.....	$177	$100	$75	$96	$1,109	.....
British Honduras	.....	.....	.....	.....	.....	929	1,119	.....	$615	$217	.....	.....	7	3	1,961	$51
Canada	$5,329	11,281	2,649	1,148	$4,858	2,819	8,537	379	51,990	4,394	6,887	2,190	9,871	97,309	205,674	7,683
Costa Rica	73	736	.....	.....	.....	186	238	96	996	11	154	.....	2	315	2,621	274
Guatemala	78	334	81	.....	.....	497	686	413	2,591	508	.....	21	63	423	5,198	.....
Honduras	.....	844	233	.....	.....	413	616	197	1,710	138	.....	.....	66	1,306	5,110	308
Nicaragua	23	.....	181	.....	.....	476	588	353	430	25	.....	8	52	73	1,733	10
Panama	.....	9,570	259	1,452	2,920	7,352	7,459	682	6,199	1,307	786	182	501	1,332	31,197	3,680
Salvador	.....	596	36	.....	.....	72	82	1,633	1,508	480	.....	.....	24	.....	4,359	108
Mexico	23,164	29,317	5,488	2	9	41,853	46,760	14,154	140,042	11,724	5,210	2,405	1,892	28,133	308,298	25,301
Miquelon, Langley, etc	.....	.....	.....	397	1,484	.....	.....	.....	.....	.....	.....	.....	.....	69	1,553	.....
Newfoundland and Labrador	1,700	183	.....	948	3,003	1,419	1,265	1,152	3,109	609	.....	24	66	811	11,922	915
Barbados	.....	51	63	.....	.....	814	988	.....	653	25	.....	.....	.....	396	2,176	290
Jamaica	2,511	884	283	.....	.....	2,024	2,717	.....	4,384	.....	2,280	71	.....	276	13,406	1,573
Trinidad and Tobago	.....	51	90	.....	.....	126	176	.....	7,380	1,803	472	.....	112	806	10,890	3,255
Other British West Indies	.....	96	.....	.....	.....	1,818	1,505	.....	549	159	540	303	70	166	3,388	60
Cuba	1,399	8,351	1,623	.....	.....	4,163	4,134	1,689	51,962	22,911	8,022	3,114	4,149	9,325	116,679	14,131
Virgin Islands of U. S	.....	.....	.....	.....	.....	939	1,681	.....	1,124	188	.....	.....	85	245	3,323	242
Dutch West Indies	11	17	.....	.....	.....	482	592	141	1,830	207	.....	.....	222	249	3,269	.....
French West Indies	.....	.....	.....	.....	.....	.....	.....	.....	450	.....	446	396	.....	.....	1,292	.....
Haiti	.....	25	.....	.....	.....	192	446	.....	3,259	318	150	.....	.....	363	4,561	123
Dominican Republic	78	294	4,528	.....	.....	818	1,165	.....	4,806	190	.....	.....	307	156	11,524	281
TOTALS, NORTH AMERICA	$34,366	$62,683	$15,536	3,947	$12,274	67,674	$81,250	$20,979	$285,587	$45,214	$25,124	$8,814	$17,564	$141,852	$751,243	$58,285
OCEANIA																
Australia	$4,117	$281	$3,418	135	$694	162	$119	.....	$13,378	$1,170	$239	$500	$1,170	$5,906	$30,992	$3,201
New Zealand	1,238	404	653	456	1,735	.....	.....	$3,283	21,792	1,630	4,481	309	86	2,937	38,548	12,581
Other British Oceania	.....	.....	.....	.....	.....	.....	.....	.....	.....	48	277	266	.....	.....	591	.....
French Oceania	.....	.....	.....	.....	.....	111	180	.....	1,187	135	.....	.....	.....	.....	1,502	20
Other Oceania	.....	.....	.....	.....	.....	304	611	.....	333	.....	.....	45	25	.....	1,014	.....
Philippine Islands	173	2,052	.....	84	201	2,954	3,002	3,166	46,437	3,250	12,393	1,695	389	3,157	75,915	4,674
TOTALS, OCEANIA	$5,528	$2,737	$4,071	675	$2,630	3,531	$3,912	$6,449	$83,127	$6,233	$17,390	$2,815	$1,670	$12,000	$148,562	$20,476
SOUTH AMERICA																
Argentina	$6,913	$6,333	.....	168	$311	58,399	$59,727	.....	$14,093	$999	$1,386	.....	$758	$13,304	$103,824	$1,626
Bolivia	.....	201	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	19	.....	220	7,564
Brazil	68	8,912	$390	.....	.....	.....	.....	$273	5,895	.....	.....	.....	65	1,672	17,275	29,621
Chile	281	11,871	900	.....	.....	.....	.....	.....	1,000	181	197	.....	450	762	15,642	11,158
Colombia	554	3,773	1,591	.....	.....	12	9	573	2,099	155	.....	.....	1,036	68	9,858	5,320
Ecuador	.....	339	.....	.....	.....	.....	.....	.....	1,047	187	.....	.....	.....	223	1,796	2,285
British Guiana	.....	.....	100	.....	.....	696	1,116	.....	255	336	.....	.....	.....	.....	1,807	147
Dutch Guiana	.....	.....	.....	.....	.....	48	80	.....	321	.....	.....	.....	.....	181	582	.....
French Guiana	.....	288	188	.....	.....	.....	.....	.....	25	3	.....	.....	.....	244	748	.....
Peru	30	2,199	180	.....	.....	.....	.....	.....	1,861	321	86	$94	12	420	5,203	4,681
Uruguay	.....	862	.....	.....	.....	.....	.....	.....	5,092	645	.....	.....	.....	656	7,255	.....
Venezuela	196	181	363	.....	.....	.....	.....	293	7,523	1,282	169	.....	114	450	10,571	4,822
TOTALS, SOUTH AMERICA	$8,042	$34,959	$3,712	168	$311	59,155	$60,932	$1,139	$39,211	$4,109	$1,838	$94	$2,454	$17,980	$174,781	$67,224

Totals, South America.	$8,042	$34,959	$3,712	168	$311	59,155	$60,932	$1,139	$39,211	$4,109	$1,838	$94	$2,454	$17,980	$174,781	$67,224	

EXPORTED TO—	Belting Value	Hose Value	Packing Value	Boots Pairs	Boots Value	Shoes Pairs	Shoes Value	Soles and Heels Value	Automobile Tires Casings Value	Automobile Tires Inner Tubes Value	Automobile Tires Solid Tires Value	Automobile Tires All Others Value	Druggists' Rubber Sundries Value	All Other Manufactures of Rubber Value	Totals Value	Insulated Wire and Cables Value
ASIA																
China	.....	$1,050	$71	.....	.....	.....	.....	.....	$1,244	$53	.....	.....	$505	$5,825	$8,748	$3,303
Chosen	.....	365	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	365	20
British India	$550	107	.....	.....	.....	1,931	$3,680	.....	4,757	936	$206	$433	.....	1,351	12,014	80,467
Straits Settlements	.....	.....	.....	.....	.....	120	138	.....	3,560	71	879	.....	.....	360	5,008	.....
Other British East Indies	.....	.....	.....	.....	.....	.....	.....	.....	237	.....	.....	.....	151	184	572	.....
Dutch East Indies	435	.....	1,355	.....	.....	147	396	.....	25,178	456	975	.....	.....	254	29,049	489
French Indo China	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	116	.....	116	.....
Hejaz, Arabia and Mesopotamia	.....	.....	.....	.....	.....	.....	.....	.....	137	196	.....	.....	.....	.....	333	.....
Hongkong	.....	.....	.....	.....	.....	894	856	.....	320	30	.....	141	261	485	2,093	.....
Japan	629	834	12,634	29,632	$62,949	20,535	18,442	$153	18,743	1,191	3,022	.....	896	15,873	135,366	361
Palestine and Syria	.....	.....	.....	.....	.....	.....	.....	.....	87	9	.....	.....	.....	.....	96	.....
Persia	.....	.....	.....	.....	.....	.....	.....	.....	1,799	.....	.....	.....	.....	.....	1,799	.....
Russia in Asia	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	7	7	.....
Turkey in Asia	.....	44	.....	.....	.....	.....	.....	.....	3,256	418	.....	.....	.....	.....	3,718	.....
TOTALS, ASIA	$1,614	$2,400	$14,060	29,632	$62,949	23,627	$23,512	$153	$59,318	$3,360	$5,076	$574	$1,929	$24,339	$199,286	$84,640
AFRICA																
Belgian Kongo	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	$40	$40	.....
British West Africa	.....	.....	.....	.....	.....	.....	.....	.....	$3,485	$1,177	.....	.....	.....	.....	4,662	.....
British South Africa	$5,345	$11,497	$3,486	.....	.....	.....	.....	$1,555	4,003	276	.....	.....	$711	2,963	29,836	$3,169
British East Africa	.....	.....	.....	.....	.....	.....	.....	.....	2,937	.....	.....	.....	.....	.....	2,937	.....
Canary Islands	.....	.....	.....	.....	.....	.....	.....	.....	218	.....	.....	.....	.....	.....	218	.....
French Africa	2,750	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2,750	.....
Portuguese Africa	.....	.....	.....	12	$47	.....	.....	.....	.....	.....	.....	.....	.....	235	282	.....
Egypt	.....	.....	.....	.....	.....	.....	.....	.....	1,713	2,066	.....	.....	.....	502	4,281	.....
TOTALS, AFRICA	$8,095	$11,497	$3,486	12	$47	.....	.....	$1,555	$12,356	$3,519	.....	.....	$711	$3,740	$45,006	$3,169
GRAND TOTALS	$79,444	$125,363	$46,689	35,203	$80,690	204,802	$225,016	$32,160	$1,046,981	$104,739	$66,645	$22,061	$39,004	$352,970	$2,221,762	$496,928

Exports of Rubber Goods to Non-Contiguous Territory of the United States

	Belting Hose, and Packing Value	Boots and Shoes Pairs	Boots and Shoes Value	Tires Automobile Value	Tires All Others Value	Druggists' Rubber Sundries Value	All Other Manufactures of Rubber Value	Totals Value	Insulated Wire and Cables Value
Hawaii	$10,802	.....	.....	$57,689	$372	.....	$14,743	$83,606	.....
Porto Rico	3,972	.....	.....	61,850	.....	.....	17,048	82,870	.....
TOTALS	$14,774	.....	.....	$119,539	$372	.....	$31,791	$166,476	.....

Compiled by the Bureau of Foreign Commerce, Department of Commerce, Washington, D. C.

OFFICIAL INDIA RUBBER STATISTICS FOR THE UNITED STATES

Imports of Crude and Manufactured Rubber

July

	1920 Pounds	1920 Value	1921 Pounds	1921 Value
UNMANUFACTURED—*free*				
India rubber				
From France	197,165	$67,798	11,356	$2,019
Netherlands	692,369	280,188	323,106	40,365
Portugal	509,146	169,974	31,717	5,843
United Kingdom	3,397,894	1,481,125	3,347,596	415,510
Canada	340	133	30,624	3,369
Central America	33,989	9,243	11,400	1,164
Mexico	154,102	31,330	.....	.....
Brazil	3,529,968	920,488	1,482,037	116,275
Peru	635,693	220,873	78,582	11,318
Other South Am	236,226	73,691	10,270	1,635
British E. Indies	24,716,293	11,622,235	20,165,924	3,248,028
Dutch E. Indies	11,018,052	4,124,481	2,011,670	357,665
Other countries	338,300	131,000	145,592	11,268
Totals	45,454,437	$19,982,599	27,647,874	$4,214,459
Balata	43,293	25,590	139,508	$19,439
Jelutong (Pontianak)	1,525,057	245,844	4,263	449
Gutta percha	844,953	190,108	114,871	23,419
Rubber scrap	1,349,283	120,692	160,291	4,648
Totals, unmanufactured	7,022	$20,564,193	28,066,807	$4,332,277
Chicle ..... *dutiable*	1,125,401	$777,897	636,825	$320,477
India rubber and gutta percha ..... *dutiable*	.....	162,429	.....	68,451

Exports of Domestic Merchandise

MANUFACTURED—				
India rubber				
Scrap and old	360,857	$27,585	416,818	$19,439
Reclaimed	378,851	65,364	56,360	5,065
Belting[1]	.....	308,588	2,206	752
Hose[1]	.....	248,502	.....	79,444
Packing[1]	.....	140,965	.....	125,363
Boots[1] ..... *pairs*	18,289	64,592	2,203	46,689
Shoes[1] ..... *pairs*	667,754	680,518	35,203	80,690
Soles and heels[1]	.....	113,371	204,802	225,016
Tires	.....	.....	.....	32,160
Casings[1]	4,269,031	473,413	.....	.....
Inner tubes[1]	.....	265,745	.....	1,046,981
Solid tires[1]	.....	151,252	.....	164,739
All other tires[1]	.....	188,921	.....	66,645
Druggists' rubber sundries[1]	.....	755,487	.....	23,061
Other rubber manufactures[1]	.....	374,398	.....	359,004
Suspenders and garters	.....	.....	.....	352,970
Totals, manufactured	.....	$8,127,732	.....	35,487
Fountain pens ..... *number*	33,011	$32,495	2,331	$2,281,753
Insulated wire and cables	.....	558,791	.....	13,647
				496,929

Exports of Foreign Merchandise

UNMANUFACTURED—				
India rubber	282,860	$97,544	850,007	$196,364
Balata	27,700	15,625	2,206	752
Guayule	1,666	1,083	.....	.....
Jelutong (Pontianak)	56,000	6,030	.....	.....
Rubber scrap	1,875	169	.....	.....
Totals, unmanufactured	370,101	$120,491	852,213	$197,116
MANUFACTURED—				
Gutta percha and india rubber substitutes	2,450	$258	.....	$490
		1,052	.....	.....
Totals, manufactured	.....	$1,310	.....	$490
Chicle	11,020	$1,112	247	$54

Exports of Rubber Goods to Non-Contiguous Territories of the United States

MANUFACTURED—				
To Alaska				
Belting, hose, and packing	.....	$10,648	.....	$8,409
Boots and shoes..*pairs*	12,333	12,635	4,398	11,961
Other rubber goods	.....	14,289	.....	6,300
Totals	.....	$57,572	.....	$26,670
To Hawaii				
Belting, hose, and packing	.....	$14,640	.....	$10,802
Automobile tires	.....	137,031	.....	57,689
Other tires	.....	2,565	.....	372
Other rubber goods	.....	14,733	.....	14,743
Totals	.....	$168,969	.....	$83,606
To Porto Rico				
Belting, hose, and packing	.....	$9,447	.....	$3,972
Automobile tires	.....	230,738	.....	61,850
Other tires	.....	24,187	.....	.....
Other rubber goods	.....	55,583	.....	17,048
Totals	.....	$319,955	.....	$82,870

[1]Details of exports of domestic merchandise by countries during July, 1921, appear on this and the preceding page.

EXPORTS OF INDIA RUBBER MANUFACTURES AND INSULATED WIRE AND CABLE FROM THE UNITED STATES BY COUNTRIES DURING THE MONTH OF AUGUST, 1921

EXPORTED TO—	Belting	Hose	Packing	Boots		Shoes		Soles and Heels	Automobile Tires				Druggists' Rubber Sundries	All Other Manufactures of Rubber	Totals	Insulated Wire and Cables
									Casings	Inner Tubes	Solid Tires	All Others				
EUROPE	Value	Value	Value	Pairs	Value	Pairs	Value	Value	Value	Value	Value	Value	Value	Value	Value	Value
Belgium	.....	.....	$94	20	$41	9,288	$5,873	.....	$3,143	$35	.....	.....	$603	$5,948	$15,737	$17,424
Denmark	$652	$252	463	36	60	14,252	14,115	.....	31,812	6,682	$353	.....	119	1,969	56,476	645
Finland	272	.....	.....	.....	.....	.....	.....	.....	36,000	.....	.....	.....	.....	.....	36,272	1,515
France	208	1,568	180	.....	.....	.....	.....	.....	21,105	1,336	.....	$99	863	30,270	55,629	3,582
Germany	.....	.....	.....	.....	.....	.....	.....	.....	28	.....	.....	.....	.....	.....	28	.....
Greece	.....	39	.....	.....	.....	.....	.....	.....	2,028	87	217	.....	.....	100	2,471	66
Hungary	3,000	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3,000	.....
Iceland and Faroe Is.	.....	.....	.....	916	2,469	1,258	1,932	.....	.....	.....	.....	.....	.....	.....	4,401	400
Italy	.....	1,550	.....	396	1,219	6,046	4,124	.....	101	14	.....	.....	.....	84	7,092	.....
Lithuania	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1,128	1,128	.....
Malta, Gozo, and Cyprus Is.	.....	.....	.....	.....	.....	.....	.....	.....	243	.....	.....	.....	.....	.....	243	.....
Netherlands	.....	1,103	.....	.....	.....	.....	.....	$520	4,985	70	148	222	520	1,535	9,103	$0
Norway	935	174	.....	.....	.....	14,090	8,659	677	13,270	1,017	3,418	.....	.....	1,458	29,608	353
Poland and Danzig	.....	.....	.....	.....	.....	.....	.....	.....	1,336	.....	6,000	.....	.....	.....	7,336	.....
Portugal	.....	.....	.....	.....	.....	.....	.....	.....	986	38	.....	.....	.....	.....	1,024	.....
Rumania	.....	.....	.....	.....	.....	9,600	10,040	.....	26,388	5,007	1,833	1,347	.....	15	44,630	.....
Spain	1,972	.....	.....	.....	.....	12,512	8,579	1,026	9,111	19	308	6	1,191	1,564	23,767	24
Sweden	179	.....	.....	.....	.....	.....	.....	.....	30,501	472	2,055	.....	.....	797	34,004	87,669
Switzerland	4	.....	.....	.....	.....	9,636	9,785	652	1,759	197	.....	.....	240	.....	12,637	.....
Turkey in Europe	.....	3,395	.....	.....	.....	6,872	7,620	656	749	484	.....	.....	.....	.....	12,904	.....
England	3,284	9,427	2,524	4,196	8,945	1,728	1,050	607	358,002	36,190	15,236	59	20,562	$3,782	509,668	20,376
Scotland	50	.....	85	.....	.....	.....	.....	.....	698	.....	288	.....	.....	1,056	2,177	.....
Ireland	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1,212	1,212	.....
Jugoslavia, Albania, etc.	.....	.....	.....	.....	.....	.....	.....	.....	4,000	.....	1,037	.....	.....	.....	5,037	.....
TOTALS, EUROPE	$10,556	$17,508	$3,346	5,564	$12,734	85,282	$71,777	$4,138	$546,245	$51,639	$30,892	$1,733	$24,098	$100,918	$875,584	$132,104
NORTH AMERICA																
Bermuda	.....	$147	.....	.....	.....	250	$366	.....	.....	.....	$76	$80	$166	$60	$895	$105
British Honduras	.....	8	$42	10	$28	702	1,026	$61	$64	$7	.....	98	17	109	1,460	58
Canada	$5,314	10,832	3,928	1,280	4,611	1,145	1,793	38	73,646	18,459	19,720	833	9,291	123,874	272,339	13,164
Costa Rica	.....	170	136	.....	.....	116	165	712	227	.....	195	.....	519	190	2,314	572
Guatemala	76	99	83	.....	.....	72	112	348	2,287	362	.....	.....	.....	542	3,911	595
Honduras	101	2,456	201	.....	.....	923	1,583	623	2,927	388	.....	.....	156	231	8,666	3,346
Nicaragua	341	175	268	.....	.....	398	522	570	284	20	.....	.....	86	437	2,703	.....
Panama	.....	215	700	.....	.....	5,655	4,502	318	9,281	471	80	241	623	1,460	17,891	5,950
Salvador	342	5	221	.....	.....	.....	.....	1,142	2,791	309	191	.....	41	38	5,080	.....
Mexico	24,422	31,644	7,788	201	1,132	32,980	41,155	5,114	84,100	8,989	2,291	11,560	2,778	23,208	244,181	19,875
Miquelon, Langley, etc.	.....	.....	.....	468	1,693	.....	.....	.....	.....	.....	.....	.....	.....	.....	1,693	.....
Newfoundland and Labrador	.....	.....	.....	1,917	5,880	119	96	709	840	92	.....	.....	22	467	8,106	568
Barbados	.....	.....	.....	.....	.....	365	463	25	1,443	227	.....	.....	.....	5	2,163	.....
Jamaica	847	224	15	.....	.....	4,915	5,629	249	10,858	629	1,171	241	190	384	20,437	145
Trinidad and Tobago	.....	258	188	.....	.....	1,088	1,409	64	7,076	725	428	150	105	499	10,902	648
Other British West Indies	94	101	142	.....	.....	280	340	.....	181	85	.....	100	152	.....	1,195	75
Cuba	.....	7,374	2,092	1	5	241	276	5,634	37,310	6,773	20,503	2,542	1,906	7,163	91,328	4,080
Virgin Islands of United States	.....	45	.....	.....	.....	690	1,133	213	1,877	403	.....	.....	.....	303	3,974	323
Dutch West Indies	.....	120	234	.....	.....	1,101	1,055	110	2,383	172	.....	.....	.....	922	4,996	.....
French West Indies	.....	.....	.....	.....	.....	.....	.....	.....	38	150	55	.....	.....	.....	243	.....
Haiti	.....	41	.....	.....	.....	.....	.....	.....	3,275	319	.....	5	.....	170	3,810	.....
Dominican Republic	.....	297	709	.....	.....	1,272	1,664	387	8,958	1,202	227	651	296	617	15,008	6,415
TOTALS, NORTH AMERICA	$31,537	$54,211	$16,749	3,877	$13,349	52,312	$63,289	$16,067	$249,846	$39,782	$44,937	$16,501	$16,348	$160,679	$723,295	$55,919
OCEANIA																
Australia	$992	$2,503	$492	.....	.....	.....	.....	.....	$5,411	$436	.....	.....	$803	$3,426	$14,063	$2,617
New Zealand	1,766	2,667	173	.....	.....	.....	.....	$1,832	32,684	1,261	$6,258	.....	132	1,538	48,311	586
Other British Oceania	.....	.....	2	.....	.....	.....	.....	.....	208	47	79	.....	17	99	452	.....
French Oceania	117	30	26	.....	.....	225	$320	.....	906	139	96	$339	15	.....	1,988	49
Other Oceania	.....	.....	.....	.....	.....	168	308	.....	.....	.....	.....	.....	.....	.....	308	.....
Philippine Islands	1,971	1,578	600	.....	.....	7,521	18,442	716	12,380	4,303	13,438	946	293	2,210	56,877	3,236
TOTALS, OCEANIA	$4,846	$6,778	$1,293	.....	.....	7,914	$19,070	$2,548	$51,589	$6,186	$19,871	$1,285	$1,260	$7,273	$121,999	$6,488
SOUTH AMERICA																
Argentina	$315	$143	$1,203	.....	.....	.....	.....	$1,112	$34,988	$7,474	$203	$2,140	$2,395	$11,515	$61,488	$8,586
Bolivia	.....	3,080	104	.....	.....	.....	.....	.....	1,683	117	.....	.....	.....	.....	4,984	419
Brazil	1,637	1,512	361	.....	.....	.....	.....	.....	5,739	.....	3,245	.....	.....	1,679	14,173	39,759
Chile	1,974	433	.....	.....	.....	16	$23	.....	3,722	367	148	.....	324	1,125	8,116	1,647
Colombia	307	5,076	298	.....	.....	2,872	3,670	1,064	5,112	303	680	210	325	915	17,960	1,874
Ecuador	.....	.....	.....	.....	.....	.....	.....	62	3,016	398	.....	.....	.....	228	3,704	772
British Guiana	.....	49	.....	.....	.....	58	97	.....	121	42	125	.....	.....	.....	434	30
Dutch Guiana	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	32	32	.....
French Guiana	.....	.....	90	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	90	.....
Peru	2,098	336	85	.....	.....	.....	.....	334	11,720	199	340	.....	150	847	16,109	5,690
Uruguay	.....	.....	92	.....	.....	756	740	984	5,818	546	.....	.....	400	25	8,605	255
Venezuela	155	274	2,506	.....	.....	.....	.....	266	5,977	980	.....	.....	50	44	10,252	5,186
TOTALS, SOUTH AMERICA	$6,486	$10,903	$4,739	.....	.....	3,702	$4,530	$3,822	$77,896	$10,426	$4,741	$2,350	$3,644	$16,410	$145,947	$64,218

EXPORTED TO—	Belting Value	Hose Value	Packing Value	Boots Pairs	Boots Value	Shoes Pairs	Shoes Value	Soles and Heels Value	Automobile Tires: Casings Value	Inner Tubes Value	Solid Tires Value	All Others Value	Druggists' Rubber Sundries Value	All Other Manufactures of Rubber Value	Totals Value	Insulated Wire and Cables Value
ASIA																
Aden	....	....	....	....	....	....	....	....	$854	$79	....	....	....	....	$933	....
China	$1,064	....	$130	24	$80	120	$115	....	7,944	112	....	....	$538	$4,745	14,728	$1,254
Chosen	....	....	....	120	339	24	19	....	....	....	....	....	57	125	540	....
British India	1,061	$809	899	....	....	2,388	3,918	....	160	....	$4,472	$150	666	2,656	14,791	25,421
Straits Settlements	....	16	....	....	....	144	135	....	2,344	233	1,636	....	42	....	4,406	....
Other British East Indies	....	....	....	....	....	....	....	$207	....	506	....	....	....	....	713	....
Dutch East Indies	....	2,788	484	....	....	....	....	....	19,842	1,486	5,235	....	1,203	15,229	46,267	6,803
French Indo China	7,661	....	....	....	....	....	....	....	....	....	....	....	....	....	7,661	....
Greece in Asia	....	....	....	....	....	....	....	....	466	199	....	....	....	....	665	....
Hongkong	....	252	211	....	....	384	420	....	1,164	149	....	280	164	252	2,892	1,358
Hejaz, Arabia, and Mesopotamia	....	....	....	....	....	....	....	....	648	....	....	....	....	....	648	....
Japan	75	196	2,207	12,793	25,494	22,824	20,860	....	6,012	15	885	....	112	13,292	69,148	9,161
Palestine and Syria	....	....	....	....	....	156	146	72	3,860	838	....	....	....	....	4,916	....
Russia in Asia	....	....	....	42	172	....	....	....	....	....	....	32	14	65	283	....
Siam	....	....	....	....	....	....	....	....	....	....	....	....	151	....	151	....
TOTALS, ASIA	$9,861	$4,061	$3,931	12,979	$26,085	26,040	$25,613	$279	$43,294	$3,617	$12,228	$462	$2,947	$36,364	$168,742	$43,997
AFRICA																
British West Africa	....	....	....	....	....	....	....	....	$6,759	$1,051	....	....	....	....	$7,810	....
British South Africa	$17,072	$14,286	$5,063	....	....	....	....	$696	11,588	786	....	....	$1,614	$4,002	55,107	$3,103
British East Africa	....	....	....	....	....	....	....	....	4,681	587	$309	....	....	....	5,577	....
French Africa	....	....	....	....	....	....	....	....	225	....	60	....	....	92	377	....
Liberia	....	....	....	....	....	....	....	....	....	....	....	....	84	5	89	....
Portuguese Africa	....	....	112	....	....	....	....	....	....	....	146	$7	....	200	465	....
Egypt	....	370	....	....	....	....	....	....	....	....	....	....	....	....	370	....
TOTALS, AFRICA	$17,072	$14,656	$5,175	....	....	....	....	$696	$23,253	$2,424	$515	$7	$1,698	$4,299	$69,795	$3,103
GRAND TOTALS	$80,358	$108,117	$35,233	22,420	$52,168	175,250	$184,279	$27,550	$992,123	$114,074	$113,184	$22,338	$49,995	$325,943	$2,105,362	$305,829

Exports of Rubber Goods to Non-Contiguous Territory of the United States

	Belting Hose, and Packing Value	Boots and Shoes Pairs	Boots and Shoes Value	Tires: Automobile Value	Tires: All Others Value	Druggists' Rubber Sundries Value	All Other Manufactures of Rubber Value	Totals Value	Insulated Wire and Cables Value
Hawaii	$3,421	....	....	$129,907	$266	....	$25,713	$159,307	....
Porto Rico	2,591	....	....	55,754	....	....	39,748	98,093	....
TOTALS	$6,012	....	....	$185,661	$266	....	$65,461	$257,400	....

Compiled by the Bureau of Foreign Commerce, Department of Commerce, Washington, D. C.

OFFICIAL INDIA RUBBER STATISTICS FOR THE UNITED STATES

Imports of Crude and Manufactured Rubber

	August 1920 Pounds	August 1920 Value	August 1921 Pounds	August 1921 Value
UNMANUFACTURED—*free*				
India rubber				
From Netherlands	122,932	$50,526	3,137,303	$519,517
Portugal	69,237	25,859	42,864	8,672
United Kingdom	1,959,770	793,204	3,564,980	504,225
Canada	152	67	200	57
Central America	30,143	12,578	....	....
Mexico	145,523	29,927	....	....
Brazil	1,317,139	325,547	1,339,406	122,834
Peru	114,405	25,095	....	....
Other South Am.	279,805	79,096	7,298	2,199
British E. Indies	34,649,711	16,480,846	22,059,725	3,251,296
Dutch E. Indies	4,226,814	1,801,010	2,371,990	449,178
Other countries	1,131,633	473,512	580,138	80,060
Totals	44,047,264	$20,097,267	33,103,904	$4,938,038
Balata	41,222	25,978	88,171	58,399
Guayule	234,953	44,113	....	....
Jelutong (Pontianak)	2,874,901	540,107	324,221	17,061
Gutta percha	1,410,791	369,448	468,450	70,609
Rubber scrap	1,281,110	105,638	302,169	14,522
Totals, unmanufactured	49,890,241	$21,182,551	34,286,915	$5,098,629
Chicle .... *dutiable*	521,738	$354,374	283,999	$142,134
India rubber and gutta percha .... *dutiable*	....	282,946	....	67,273

Exports of Domestic Merchandise

	August 1920 Pounds	August 1920 Value	August 1921 Pounds	August 1921 Value
MANUFACTURED—				
India rubber				
Scrap and old	281,084	$24,094	756,204	$36,569
Reclaimed	429,603	74,652	132,791	16,360
Belting[1]	....	322,613	....	80,358
Hose[1]	....	251,807	....	108,117
Packing[1]	....	103,727	....	35,233
Boots[1] .... *pairs*	14,255	49,396	22,420	52,168
Shoes[1] .... *pairs*	488,638	481,460	175,250	184,279
Soles and heels[1]	....	65,964	....	27,550
Tires				
Casings[1]	....	3,121,530	....	1,132,212
Inner tubes[1]	....	327,009	....	114,074
Solid tires[1]	....	265,549	....	113,184
All other tires[1]	....	53,931	....	22,338
Druggists' rubber sundries[1]	....	129,838	....	49,995
Other rubber manufactures[1]	....	601,505	....	325,943
Suspenders and garters	....	291,852	....	36,964
Totals, manufactured	....	$6,164,927	....	$2,335,344
Fountain pens .... *number*	21,079	$25,907	3,150	$2,170
Insulated wire and cables	....	420,208	....	305,829

Exports of Foreign Merchandise

	August 1920 Pounds	August 1920 Value	August 1921 Pounds	August 1921 Value
UNMANUFACTURED—				
India rubber	684,322	$241,238	1,002,264	$205,853
Balata	99,778	50,640	2,539	1,011
Rubber scrap	330	31	....	....
Totals, unmanufactured	784,430	$291,909	1,004,803	$206,864
MANUFACTURED—				
Gutta percha and india rubber	....	....	....	$1,474
Totals, manufactured	....	....	....	$1,474
Chicle	309	$270	940	$346

Exports of Rubber Goods to Non-Contiguous Territories of the United States

	August 1920 Pounds	August 1920 Value	August 1921 Pounds	August 1921 Value
MANUFACTURED—				
To Alaska				
Belting, hose, and packing	....	$6,030	....	$3,672
Boots and shoes. *pairs*	10,531	37,904	6,458	19,859
Other rubber goods	....	8,522	....	4,809
Totals	....	$52,456	....	$28,340
To Hawaii				
Belting, hose, and packing	....	$13,254	....	$3,421
Automobile tires	....	167,451	....	129,907
Other tires	....	3,834	....	266
Other rubber goods	....	30,364	....	25,713
Totals	....	$214,903	....	$159,307
To Porto Rico				
Belting, hose, and packing	....	$9,108	....	$2,591
Automobile tires	....	158,253	....	55,754
Other tires	....	1,211	....	....
Other rubber goods	....	52,967	....	39,748
Totals	....	$221,539	....	$98,093

[1]Details of exports of domestic merchandise by countries during August, 1921, appear on this and the preceding page.

UNITED KINGDOM RUBBER STATISTICS

Imports

	September 1920 Pounds	September 1920 Value	September 1921 Pounds	September 1921 Value
UNMANUFACTURED				
Crude rubber				
From—				
Straits Settlements	7,537,400	£703,073	2,553,800	£98,191
Federated Malay States	4,659,400	460,194	3,536,000	143,038
British India	582,800	54,089	395,500	16,157
Ceylon and dependencies	4,095,200	383,202	2,474,000	102,775
Other Dutch possessions in Indian Seas	590,400	58,974	768,700	29,603
Dutch East Indies (except other Dutch possessions in Indian Seas)	649,400	53,665	674,900	25,315
Other countries in East Indies and Pacific, not elsewhere specified	142,300	13,978	224,800	9,552
Brazil	801,200	63,322	290,300	11,632
Peru	8,900	896	.....	.....
South and Central America (except Brazil and Peru)	12,400	1,174	40,300	1,806
West Africa				
French West Africa	300	25	.....	.....
Gold Coast	11,900	995	700	24
Other parts of West Africa	18,200	1,877	.....	.....
East Africa, including Madagascar	122,000	9,819	7,200	288
Other countries	1,105,700	91,674	.....	.....
Totals	20,337,500	£1,896,957	10,966,200	£438,381
Waste and reclaimed rubber	497,200	7,779	92,800	869
Gutta percha and balata	900,800	179,755	132,300	28,790
Rubber substitutes	8,700	658	.....	.....
Totals, unmanufactured	21,744,200	£2,085,149	11,191,300	£468,030
MANUFACTURED				
Boots and shoes, *doz. pairs*	5,112	£14,975	1,909	£8,106
Waterproof clothing	.....	484	.....	3,365
Insulated wire	.....	3,342	.....	4,310
Tires and tubes	.....	581,946	.....	584,913
Other rubber manufactures	.....	45,737	.....	55,989
Totals, manufactured	.....	£646,484	.....	£656,683

Exports

UNMANUFACTURED				
Waste and reclaimed rubber	1,808,900	£31,479	364,500	£7,632
Rubber substitutes	166,000	8,188	78,600	1,963
Totals, unmanufactured	1,974,900	£39,667	443,100	£9,595
MANUFACTURED				
Boots and shoes, *doz. pairs*	8,336	£22,478	10,192	£20,020
Waterproof clothing	.....	306,793	.....	119,725
Insulated wire	.....	164,837	.....	68,314
Submarine cables	.....	72,992	.....	56,502
Tires and tubes	.....	514,486	.....	165,347
Other rubber manufactures	.....	389,704	.....	175,686
Totals, manufactured	.....	£1,471,290	.....	£605,594

Exports—Colonial and Foreign

UNMANUFACTURED				
Crude rubber				
To Russia	23,400	£3,200	.....	.....
Sweden, Norway and Denmark	440,100	37,979	10,300	£396
Germany	736,600	59,981	1,533,600	43,861
Belgium	147,700	14,591	254,200	9,204
France	1,323,400	126,727	2,146,500	82,311
Spain	46,400	4,202	44,700	1,833
Italy	129,600	11,218	321,200	10,904
Austria-Hungary	6,700	650	44,300	1,834
Other European countries	272,800	24,055	893,700	33,016
United States	274,100	26,589	7,500,300	278,291
Canada	683,200	68,810	49,500	1,696
Other countries	184,600	19,482	.....	.....
Totals	4,268,600	£397,484	12,798,300	£463,346
Waste and reclaimed rubber	38,100	830	11,000	140
Gutta percha and balata	48,400	5,881	90,500	16,734
Totals, unmanufactured	4,355,100	£404,195	12,899,800	£480,220
MANUFACTURED				
Boots and shoes, *doz. pairs*	1,185	£4,218	502	£1,866
Waterproof clothing	.....	20	.....	71
Insulated wire	.....	1,142	.....	.....
Tires and tubes	.....	16,197	.....	22,039
Other rubber manufactures	.....	2,101	.....	2,844
Totals, manufactured	.....	£23,678	.....	£26,820

RUBBER STATISTICS FOR THE DOMINION OF CANADA

Imports of Crude and Manufactured Rubber

	August 1920 Pounds	August 1920 Value	August 1921 Pounds	August 1921 Value
UNMANUFACTURED—*free*				
Rubber, gutta percha, etc.				
From United Kingdom	48,620	$22,092	8,960	$1,656
United States	309,368	92,019	906,953	145,041
Belgium	66,498	36,676	.....	.....
Brazil	40,000	13,000	.....	.....
British East Indies				
Straits Settlements	235,230	109,923	376,360	64,767
Total	699,716	$273,710	1,292,273	$211,464
Rubber recovered	509,455	79,863	73,966	9,607
Rubber, powdered, and rubber or gutta percha scrap	40,340	4,844	77,592	1,806
Rubber substitutes	212,477	27,878	6,060	1,543
Totals, unmanufactured	1,461,988	$386,295	1,449,891	$224,420
PARTLY MANUFACTURED				
Hard rubber sheets and rods	7,911	$5,717	197	$242
Hard rubber tubes	.....	4,113	.....	.....
Rubber thread, not covered	3,873	5,352	5,460	8,202
Totals, partly manufactured	11,784	$15,182	5,657	$8,444
MANUFACTURED				
Belting	.....	$13,002	.....	$3,184
Hose	.....	13,946	.....	8,984
Packing	.....	7,964	.....	4,730
Boots and shoes	.....	11,820	.....	4,860
Clothing, including waterproofed	.....	31,157	.....	15,168
Gloves	.....	1,045	.....	1,074
Hot-water bottles	.....	731	.....	110
Tires, solid	.....	22,201	.....	15,357
Tires, pneumatic	.....	213,803	.....	93,845
Inner tubes	.....	25,014	.....	13,527
Elastic, round or flat	.....	50,960	.....	32,610
Mats and matting	.....	183	.....	51
Cement	.....	4,509	.....	2,396
Other rubber manufactures	.....	162,038	.....	93,204
Totals, manufactured	.....	$558,373	.....	$289,100
Totals, rubber imports	1,473,772	$959,850	1,455,548	$521,964
Insulated wire and cables				
Wire and cables covered with cotton, linen, silk, rubber, etc.	.....	$36,461	.....	$8,572
Copper wire and cables, covered as above	.....	68,246	.....	15,103
Chicle	48,329	23,198	49,434	22,233
Fillets	.....	511	.....	784
Webbing	.....	60,565	.....	33,211
Fountain pens	.....	4,468	.....	2,329

Exports of Domestic and Foreign Rubber Goods

	August 1920 Produce of Canada Value	August 1920 Reexports of Foreign Goods Value	August 1921 Produce of Canada Value	August 1921 Reexports of Foreign Goods Value
UNMANUFACTURED—				
Crude and waste rubber	$25,275	.....	$5,240	$56
MANUFACTURED				
Belting	$9,615	.....	.....	.....
Hose	23,518	.....	$10,983	.....
Boots and shoes	72,937	.....	23,612	$31
Clothing, including waterproofed	2,398	.....	1,038	645
Tires, pneumatic	898,146	.....	180,511	.....
Tires	1,486	$515	3,052	436
Other manufactures	73,235	4,467	7,437	2,729
Totals, manufactured	$1,081,335	$4,982	$226,633	$3,841
Totals, rubber exports	$1,106,610	$4,982	$231,873	$3,897

RUBBER STATISTICS FOR SCANDINAVIA

Sweden

Imports of Crude and Manufactured Rubber

	June 1920	June 1921	Six Months Ended June 30 1920	Six Months Ended June 30 1921
UNMANUFACTURED—				
Crude rubber, *kilos*[1]	210,690	88,022	798,440	568,440
MANUFACTURED—				
Rubber footwear	7,055	842	49,046	16,578
Clothing and similar goods, coated or impregnated with rubber	34,896	11,794	302,551	62,378
All other rubber goods	293,131	109,684	2,022,874	743,469

Exports of Crude and Manufactured Rubber

	June		Six Months Ended June 30	
	1920	1921	1920	1921
UNMANUFACTURED—				
Waste and old rubber.....*kilos*[1]	10,174	3,000	201,407	28,012
MANUFACTURED—				
Footwear	.....	830	7,020	8,214

Norway

Imports of Crude and Manufactured Rubber

	December		Year Ended December	
	1919	1920	1919	1920
UNMANUFACTURED—				
Crude rubber and gutta percha.*kilos*[1]	62,124	14,095	444,373	245,245
MANUFACTURED—				
Oiled and rubberized clothing.	7,637	2,061	82,709	152,647
Rubber in sheets, threads, tubes, etc.	65,456	21,696	368,688	279,168
Soles, rings, mats, etc.....	18,552	31,165	462,757	675,237
Footwear	55,213	76,870	472,588	639,297
Other rubber goods.....	3,272	2,438	61,519	67,331

Exports of Crude and Manufactured Rubber

UNMANUFACTURED—				
Waste .....*kilos*[1]	35,000	12,045	150,030	151,630
MANUFACTURED—				
Footwear, etc. .....*kilos*[1]	.....	22	.....	4,836
Oiled and rubberized clothing.	1,287	2,502	22,886	28,592

Imports of Crude and Manufactured Rubber

	June		Six Months Ended June	
	1920	1921	1920	1921
UNMANUFACTURED—				
Crude rubber and gutta percha.*kilos*[1]	23,938	15,623	110,575	80,715
MANUFACTURED—				
Oiled and rubberized clothing	10,482	4,073	94,179	26,743
Rubber in sheets, threads, tubes, etc.	18,915	12,739	134,886	45,655
Soles, rings, mats, etc.....	103,279	20,082	438,095	140,729
Footwear	14,008	12,165	285,718	107,061
Other rubber goods.....	4,239	2,228	27,272	13,724

Exports of Crude and Manufactured Rubber

UNMANUFACTURED—				
Waste	24,752	.....	100,354	4,028
MANUFACTURED—				
Footwear, etc.....	.....	.....	8	8
Oiled and rubberized clothing	877	2,426	18,890	17,110

Denmark

Imports of Crude and Manufactured Rubber

	June		Six Months Ended June	
	1920	1921	1920	1921
UNMANUFACTURED—				
Crude rubber.....*kilos*[1]	6,300	11,600	273,000	184,800
MANUFACTURED—				
Footwear	16,400	700	71,200	18,300
Cycle tires	158,000	73,300	959,900	360,400
Hose	19,400	12,200	76,700	55,300
Manufactures of rubber combined with fabric.....	51,800	26,300	250,700	135,800
Manufactures of rubber without fabric	15,400	11,000	139,200	85,600

[1]One kilo equals 2.2 pounds.

RUBBER STATISTICS FOR GERMANY FOR THE YEAR 1920

Imports of Crude and Manufactured Rubber

	1920 Quintals[1]
UNMANUFACTURED—	
India rubber, raw and refined	
From Equatorial Africa	14,851
British India	26,553
Ceylon	19,169
Dutch East Indies	32,624
Brazil	11,068
Other countries	17,834
Total	122,099
Gutta percha, raw and refined	
From Malaya	525
Dutch East Indies	1,252
Other countries	908
Total	2,685
Balata, raw and refined	
From Dutch East Indies	1,538
Other America	235
South America	1,089
Other countries	264
Total	3,126
India rubber, gutta percha and balata waste	35,604
Rubber substitute	225
Total, unmanufactured	163,739
MANUFACTURED—	
Soft rubber goods:	
Rubber solutions	25
Soft rubber paste, plates thereof; unworked pieces of rubber and metal tread plates, all unvulcanized; gutta percha paper	1,678
Cut plates (patent plates), not vulcanized	98
Threads	140
Threads combined with fabric	3
Tubes	32
Belting of rubber combined with fabric	829
Wagon covers of fabric and rubber	402
Rubber shoes	327
Packing	259
Elastic goods, silk and rubber	152
Elastic goods, other fabrics and rubber	450
Rubber press cloths and card clothing	1,082
Tubes for automobiles and trucks	
From Belgium .....*number*	12,693
France	22,865
Great Britain	5,254
United States	19,274
Other countries	4,828
Total	64,914
Total weight .....*quintals*	1,348
Tubes for tires, etc.	
From Belgium .....*number*	39,100
France	50,718
United States	13,163
Other countries	35,034
Total	138,015
Total weight .....*quintals*	452
Automobile treads	
From Belgium .....*number*	20,021
Denmark	21,306
France	26,369
Great Britain	12,564
United States	13,054
Other countries	18,106
Total	111,420
Total weight .....*quintals*	5,336
Bicycle treads	
From Denmark .....*number*	23,356
France	56,507
Other countries	21,615
Total	101,478
Total weight .....*quintals*	936
Tires for other vehicles	
From Belgium .....*number*	18,331
France	13,306
Great Britain	4,580
United States	10,782
Other countries	3,535
Total	50,534
Total weight .....*quintals*	4,625
Other goods including matting, sheets combined with fabric, iron rolls with rubber	2,246
Hard rubber	
Unvulcanized hard rubber paste	1
Dental rubber	25
Sheets, bars	25
Rods	1
Other	139
Totals, manufactured	20,611
Total imports	184,350

Exports of Crude and Manufactured Rubber

	Quintals	Marks
UNMANUFACTURED—		
India rubber, raw and refined		
To Austria	480	
Czechoslovakia	527	3,841,000
Other countries	147	
Totals	1,154	3,841,000
Rubber, gutta percha, balata waste	791	776,000
Gutta percha, raw and refined	63	327,000
Balata	72	577,000
Rubber substitute	1,971	4,143,000
Totals, unmanufactured	4,051	9,664,000
MANUFACTURED—		
Soft rubber goods		
Rubber solution, paste, regenerated rubber, sheets, all unvulcanized; gutta percha paper	3,230	8,989,000
Threads and tubes	4,935	33,587,000
Tubes, tires, treads of rubber, and treads of leather		
To Denmark	799	
Italy	172	
Netherlands	784	
Switzerland	939	75,598,000
South-East Asia	500	
South America	531	
Other countries	1,098	
Belting, packing, press cloths, card clothing	2,961	10,333,000
Wagon covers of fabric and rubber; fabric with rubber or rubber threads, rubber goods combined with fabric	2,213	35,726,000
Rubber shoes, heels, soles, erasers, balls (not toys); rubber sheets with fabric, other soft rubber goods, rolls covered with rubber	11,104	90,827,000
Hard rubber and hard rubber goods excepting surgical instruments	1,838	40,343,000
Hard rubber goods, not specified	26	422,000
Totals, manufactured	31,130	295,825,000
Total exports	35,181	305,489,000

[1] One quintal equals 220.46 pounds.

RUBBER STATISTICS FOR ITALY

Imports of Crude and Manufactured Rubber

	Five Months Ended May			
	1920		1921	
	Quintals[1]	Lire[2]	Quintals	Lire
UNMANUFACTURED—				
Crude rubber and gutta percha—raw and reclaimed				
From French colonies in Asia	.....		177	
India and Ceylon	3,241		428	
Straits Settlements	6,577		15,415	
French African Colonies	578		.....	
Great Britain	169	18,546,850	266	19,949,050
Netherlands	.....		2,723	
Dutch East Indies	.....		956	
Belgian Congo	875		.....	
Brazil	5,783		530	
Other countries	2,300		504	
Totals	19,523	18,546,850	20,999	19,949,050
Rubber scrap	136	20,400	103	15,450
Totals, unmanufactured	19,659	18,567,250	21,102	19,964,500
MANUFACTURED—				
India rubber and gutta percha—				
Threads	156	452,400	146	423,400
Sheets, including hard rubber	60	109,700	118	214,300
Tubes	82	193,100	318	450,400
Belting	330	544,500	152	250,800
Rubber coated fabrics in pieces	370	715,600	250	534,000
Boots and shoes, *pairs*	58,106	1,162,120	5,257	105,140
Elastic webbing	186	632,400	389	1,322,600
Clothing and articles for travel	105	420,000	49	196,000
Tires and tubes—				
From Belgium	632		51	
France	1,806		1,743	
Great Britain	2,574	16,245,600	757	7,789,600
United States	782		105	
Other countries	8		126	
Other manufactures	8,169	15,222,700	2,193	4,148,800
Totals, manufactured	.....	35,698,120	.....	15,435,040
Total imports	.....	54,265,370	.....	35,399,540

Exports of Crude and Manufactured Rubber

UNMANUFACTURED—				
India rubber and gutta percha—raw and reclaimed				
To Austria	300		100	
France	239		2,979	
Spain	468	1,459,500	333	1,888,000
United States	1,907		.....	
Other countries	45		364	
Totals	2,919	1,459,500	3,776	1,888,000
Waste	3,839	767,800	913	182,600
Totals, unmanufactured	6,758	2,227,300	4,689	2,070,600
MANUFACTURED—				
India rubber and gutta percha—				
Thread	153	474,300	151	468,100
Sheets, including hard rubber	121	224,300	179	367,100
Tubes	669	864,600	913	1,180,800
Belting	.....	.....	7	14,700
Rubber coated fabrics in pieces	109	328,600	106	318,400
Boots and shoes, *pairs*	445	8,900	100	2,000
Other footwear	1	1,500	2	3,000
Elastic webbing	562	2,135,600	333	1,265,400
Clothing and articles for travel	202	1,010,000	37	185,000
Tires and tubes				
To Austria	1,195		776	
Belgium	475		1,063	
Czecho-Slovakia	468		96	
Denmark	620		1	
France	701		722	
Great Britain	4,540		3,859	
Netherlands	222		156	
Rumania	610		641	
Spain	139		129	
Switzerland	325	46,387,500	319	29,247,500
Hungary	216		.....	
India and Ceylon	2,582		496	
Dutch East Indies	1,444		721	
Straits Settlements	925		84	
Australia	406		.....	
Argentina	1,407		892	
Brazil	1,259		127	
Other countries	1,021		1,617	
Other rubber goods	4,447	8,282,000	5,632	10,359,200
Totals, manufactured	.....	59,717,300	.....	43,411,200
Total exports	.....	61,944,600	.....	45,481,800

[1]Quintal equals 220.46 pounds.
[2]One lira equals $0.193 (normal).

THE MARKET FOR RUBBER SCRAP

New York

No important change has developed in the market for rubber scrap. Business is of negligible proportions, and at most unsatisfactory prices. Inquiries from reclaimers indicate that they are still operating at fractional capacity. Improved conditions in the scrap market are not expected for the remainder of the year.

Higher prices are being paid for boots and shoes, ranging from 3⅝ to 3¾ cents a pound, delivered.

Dealers have been offering from 60 to 75 cents a 100 pounds for mixed tires. Mechanical grades are practically without value, other than nominal.

Quotations for Carload Lots Delivered

November 23, 1921

Prices subject to change without notice

Boots and Shoes			
Boots and shoes	lb.	$0.03½ @	.03¾
Trimmed arctics	lb.	.02¾ @	
Untrimmed arctics	lb.	.02½ @	
Hard Rubber			
Battery jars, black compound	lb.	*.07½ @	
No. 1, bright fracture	lb.	*.12 @	.15
Inner Tubes			
No. 1	lb.	.04¼ @	
Compounded	lb.	.03¾ @	
Red	lb.	.03½ @	
Mechanicals			
Black scrap, mixed, No. 1	lb.	*.02¼ @	.03
No. 2	lb.	*.01½ @	.02
Heels	lb.	*.02½ @	.03
Horse-shoe pads	lb.	*.02½ @	.03
Hose, air brake	lb.	*.01 @	.01½
fire, cotton lined	lb.	*.01 @	
garden	lb.	.07 @	
Matting	lb.	*.01 @	
Red packing	lb.	*.04½ @	.05
Red scrap, No. 1	lb.	*.07 @	.08
No. 2	lb.	*.05½ @	.06
White scrap, No. 1	lb.	*.07 @	.07½
No. 2	lb.	.06 @	.06½
Tires			
Pneumatic—			
Auto peelings	lb.	.01½ @	
Bicycle	lb.	.01 @	.01¼
Standard white auto	lb	*.02¼ @	.02¾
Mixed auto	lb.	.00¾ @	.01
Stripped, unguaranteed	lb	*.01 @	.01½
White, G. & G., M. & W., and U. S.	lb.	*.02¾ @	
Solid—			
Carriage	lb.	*.02¼ @	.02½
Iron	lb.	@	
Truck, clean	lb.	*.01½ @	.02

*Nominal.

THE MARKET FOR COTTON AND OTHER FABRICS

New York

AMERICAN COTTON. Spot middling upland cotton prices rose nearly to 20 cents on October 26, then declined to 18¾ to 19 cents, which level was fairly maintained until November 9, when the market experienced a steady decline to around 16¾ cents, the lowest in some weeks. This level marks the turning point of a week of rising values to 17¼ cents.

Comparison of consumption of cotton by American mills for September this year with the same month a year ago indicates that they operated in September at 90 per cent of capacity.

Cotton exports have been heavy during the month, aggregating in the four weeks ended October 21, 754,000 bales, com-

pared with 453,000 in the corresponding period in 1920, and 289,000 in that of 1919.

Cotton fabrics for the rubber trade have not been in active demand, and prices are not firm. Buyers have lost confidence in the market, on account of the recent drop in cotton, and are now waiting for a reduction in price.

EGYPTIAN COTTON. During the past month prices of Egyptian cotton have fluctuated sharply, but the general tendency has been downward, owing to seasonable receipts of cotton in Alexandria and a very spasmodic demand. Medium-grade uppers are selling from 28 to 30 cents, and medium-grade Sakellarides from 29 to 30 cents.

Cotton receipts at Alexandria leave much to be desired, both as to quality and staple. High grades command heavy premiums in consequence. Practically all business with the United States thus far this season has been in uppers, and it is not improbable that this grade will be increasingly difficult to buy late in the season.

SEA ISLAND COTTON. Prices are practically unchanged. The present crop is no larger than was expected, and the supply during the coming year will, therefore, be exceedingly small.

ARIZONA COTTON. This grade has declined slightly in value. There is much dissatisfaction in the Salt River Valley over the inability to turn cotton into cash, and it is presumed that much short cotton will be planted there during the coming season. The Government is said to be taking steps to prevent this, but unless a wider market develops within the next two or three months probably a good deal of shorter staple cotton will be planted there next Spring.

MECHANICAL DUCKS AND DRILLS. The demand is light, owing to the fractional capacity operation of the rubber mills and the expectation that lower prices may rule.

RAINCOAT CLOTHS. There is little doing in this line for essentially the same reason as in mechanicals. Buyers have lost confidence. Quotations remain unchanged from last month.

SHEETING. There is some buying of sheetings going on but only in a small way. Prices are easier and sellers are willing to make concessions in prices. Material improvement in business is not expected until the middle of January.

TIRE FABRICS. The mills are not booking much business at present quotations because in competition lower prices are named, based either on material purchased some time ago at lower prices, or on the necessity of unloading high-priced material at the best price obtainable.

New York Quotations

November 23, 1921

Prices subject to change without notice

Burlaps			
32—7-ounces	100 yards	$4.00	@
32—8-ounces		4.00	@
40—7½-ounce		4.25	@
40—8-ounce		4.50	@
40—10-ounce		5.25	@
40—10½-ounce		5.50	@
45—7½-ounce		6.00	@
45—8-ounce		6.25	@
45—10-ounce			@
Drills			
38-inch 2.00-yard	yard	.20	@
40-inch 3.47-yard		.12½	@
52-inch 1.90-yard		.22½	@
52-inch 1.95-yard		.21⅜	@
60-inch 1.52-yard		.27⅜	@
Duck			
Carriage Cloth			
38-inch 2.00-yard enameling duck	yard	.19½	@
40-inch 1.47-yard		.26¾	@
72-inch 16.66-ounce		.44½	@
72-inch 17.21-ounce		.46	@
Mechanical			
Hose	pound	.37	@
Belting		.37	@
Hollands, 40-inch			
Acme	yard	.20	@
Endurance		.23½	@
Penn		.26½	@
Dead Finish			
Piece		.23½	@
Cut		.25½	@
Flat Finish			
Piece		.17½	@
Cut		.19½	@
Lonsdale			
White, piece		.40	@
cut		.50	@
Colors, piece		.42½	@
cut		.53	@
Green and blue, piece		.46½	@
cut		.58	@
Nainsooks			
White			@
Flesh			@
Raincoat Fabrics			
Cotton			
Bombazine 64 x 60	yard	.13	@
60 x 48		.11½	@
Cashmeres, cotton and wool, 36-inch, tan		.55	@
Twills 64 x 72		.10	@ .12
60 x 102		.14	@
Twill, mercerized, 36-inch, blue and black		.26½	@
tan and olive		.25	@
Tweed		.20	@ 1.00
printed		.15	@
Plaids 60 x 48		.12½	@
56 x 44		.11¾	@
Repp			@
Prints 60 x 48		.13	@
64 x 60		.14	@

Sheetings, 40-inch

48 x 48, 2.50-yard	yard	$0.13¼ @
48 x 48, 2.85-yard		.12¼ @
64 x 68, 3.15-yard		.13½ @
56 x 60, 3.60-yard		.11¼ @
48 x 44, 3.75-yard		.10½ @

Silks

Canton, 38-inch	yard	.29½ @
Schappe, 36-inch		.45 @

Stockinettes

Single Thread

3½ Peeler, carded	pound	@
4½ Peeler, carded		@
6½ Peeler, combed		@

Double Thread

Zero Peeler, carded	pound	@
3½ Peeler, carded		@
6½ Peeler, combed		@

Tire Fabrics

Building

17¼-ounce Sakellarides, combed	pound	1.20	@
17¼-ounce Egyptian, combed		.95	@
17¼-ounce Egyptian, carded		.90	@
17¼-ounce Peelers, combed		.90	@
17¼-ounce Peelers, carded		.65	@

Cord

15-ounce Egyptian	pound	1.00	@

Bicycle

8-ounce American	pound	@
10-ounce American		@

Chafer

9¼-ounce Sea Island	pound		@
9¼-ounce Egyptian, carded		.98	@
9¼-ounce Peeler, carded		.73	@

THE MARKET FOR CHEMICALS AND COMPOUNDING INGREDIENTS

New York

In all lines of industrial chemicals and compounding ingredients activity is moderate but increasing hopefully. For the most part prices hold to the levels of a month ago. The demand for materials by the rubber industry is somewhat better than routine with manufacturers optimistic.

ANILINE. Prices were firmer at the beginning of the month shading off somewhat toward the close to 18 to 20 cents a pound, due in part to increased supplies of benzol.

BARYTES. Early in the month the possibility of a nation-wide railway strike caused much activity in spot demand for barytes. With the elimination of this disturbing influence interest naturally subsided to routine basis.

BENZOL. The supply of benzol has shown steady increase throughout the month as the number of coke ovens in operation multiplied. It is still, however, subnormal.

BLANC FIXE. The demand shows some improvement but is still moderate.

CADMIUM SULPHIDE. The price continues steady at $1.25 to $1.50 a pound. The use of this material by the rubber industry is naturally rather limited.

CARBON BISULPHIDE. The demand has been maintained strong and increasing throughout the month as the supply became shorter in amount. Price held from 7 to 7½ cents a pound.

CARBON TETRACHLORIDE. Market conditions were somewhat stagnant. Prices range from 11 to 14 cents a pound.

CHINA CLAY. The demand has been supplied chiefly from foreign sources owing to the prevailing excessive freight rates acting to prevent shipment of the domestic product. This condition is hopeless till revision of freight rates takes place.

DRY COLORS. Some improvement in dry color business has been noted. Prices are not likely to be further reduced.

GAS BLACK. The market and prices for both gas blacks and lamp blacks have both been steady throughout the month.

LITHARGE. Improvement in this market was noted some weeks ago and it still continues. Prices steady at 7½ to 7¾ cents a pound.

LITHOPONE. The demand is good. Imports from Belgium and Germany have been considerable although they have not constituted serious competition for the domestic product, which is regarded as intrinsically superior to the foreign lithopone, particularly to the German.

SOLVENT NAPHTHA. There is a shortage of stock which seems, however, to be ample for the requirements of consumers.

SUBLIMED LEAD. A gradual increase of business to the active stage took place as the month progressed against which the price remained unchanged.

SULPHUR. Business has been only routine. Flour priced at $2 to $2.90 a hundred.

SULPHUR CHLORIDE. Steady call. Price 8 to 20 cents a pound.

TALC. There has been a steadily continuing demand for both foreign and domestic grades.

WHITING. The steady business early in the month developed shortly to a very active condition which has been well maintained. The price for commercial grade is firm at $1.15 per 100 pounds.

ZINC OXIDE. There has been a gradual improvement in the market. The demand from tire makers has been well sustained.

New York Quotations

November 23, 1921

Prices subject to change without notice

Accelerators, Organic

Accelerene (f. o. b. English port)	lb.	13s.	@	
Accelemal (bbls.)	lb.		@	
Adeo	lb.	$0.75	@	
Aldehyde ammonia crystals	lb.	.95	@	1.00
Aniline (f. o. b. factory)	lb.	.17½	@	.22
Excellerex	lb.	.50	@	.65
Formaldehyde aniline	lb.	.50	@	.55
Hexamethylene tetramine	lb.	.77½	@	.80½
Lead oleate (400 lb. bbls. factory)	lb.	.18	@	
N. C. C.	lb.	.35	@	.40
No. 999	lb.	.13½	@	
Paradin	lb.	.41	@	
Paranitroso dimethylaniline	lb.	2.25	@	
Paraphenylene diamine	lb.	1.60	@	1.75
Thiocarbanilide	lb.	.38	@	.50
Vul Ko Cene	lb.	.35	@	
X L O	lb.	2.00	@	

Accelerators, Inorganic

Lead, dry red	lb.	.10	@	
sublimed blue	lb.	.07	@	
sublimed white	lb.	.07	@	
white, basic carbonate	lb.	.06½	@	.07½
Lime, flour	lb.	.02	@	.02½
Litharge, domestic	lb.	.07½	@	.07¾
imported	lb.	.17	@	
sublimed	lb.		@	
Orange mineral	lb.	.11	@	.13
Magnesium, carbonate, light	lb.	.06	@	.10
calcined light (bbls.)	lb.	.27	@	.30
extra light (bbls.)	lb.	.50	@	
medium light (bbls.)	lb.	.25	@	
calcined heavy (bbls.)	lb.	.06	@	.07½

Acids

Acetic 28 per cent	lb.	.02¼	@	.02½
glacial, 99 per cent	lb.	.10	@	.10¾
Cresylic (97% straw color, drums)	gal.	.70	@	
(95% dark, drums)	gal.	.60	@	.65
Muriatic, 20 degrees	cwt.	1.75	@	2.00
Nitric, 36 degrees	cwt.	6.50	@	7.00
Sulphuric, 66 degrees	cwt.	1.50	@	2.00

Alkalies

Caustic soda	lb.	.04	@	.05
Soda ash, 58%	cwt.	1.90	@	2.45

Colors

Black

Bone, powdered	lb.	.05½	@	.07½
Carbon black	lb.	.10½	@	.20
pressed	lb.	.10½	@	.12½
Dipped goods	lb.	1.00	@	
Drop	lb.	.09	@	.16
Ivory black	lb.	.15	@	.45
Lampblack	lb.	.15	@	.45
Micronex	lb.	.12	@	.15
Oil soluble aniline	lb.		@	
Rubber black	lb.	.10	@	.16
Rubber makers' non-flying black	lb.	.40	@	

Blue

Cobalt	lb.	$0.27	@	$0.35
Dipped goods	lb.	1.00	@	
Prussian	lb.	.50	@	.55
Rubber makers' blue	lb.	3.50	@	
Ultramarine	lb.	.16	@	.35

Brown

Iron oxide	lb.	.04	@	.05
Sienna, Italian, raw and burnt	lb.	.04¾	@	.05¼
Sienna, Italian, raw (tan color)	lb.	.07	@	
Umber, Turkey, raw and burnt	lb.	.05½	@	.06
Vandyke	lb.	.03¾	@	.05

Green

Chrome, light	lb.	.30	@	.32
medium	lb.	.35	@	.36
dark	lb.	.36	@	.45
commercial	lb.	.12	@	
tile	lb.	.11	@	.13
Guignet	lb.	1.50	@	
Dipped goods	lb.	1.00	@	
Oxide of chromium	lb.	.50	@	.60
Rubber makers' green	lb.	3.50	@	

Red

Antimony, crimson	lb.	.40	@	.45
crimson, 15/17% (bbls.)	lb.	.38	@	.46
crimson, F	lb.	.35	@	
crimson, R. M. P.	lb.	.48	@	
Antimony, golden	lb.	.27	@	.30
golden, R. M. P.	lb.	.18	@	
golden 1	lb.	.30	@	
golden 2	lb.	.25	@	
golden, 15/17% (bbls.)	lb.	.22	@	
7-A	lb.	.35	@	
vermilion	lb.	.55	@	
red sulphuret	lb.	.21	@	.24
Arsenic, red sulphide	lb.	.12	@	.12½
Dipped goods, red	lb.	1.00	@	
purple	lb.	1.00	@	
orange	lb.	1.00	@	
Indian	lb.	.08	@	.14
Iron oxide, reduced grades	lb.	.03	@	.13
pure bright	lb.	.05	@	.14
Maroon oxide	lb.	.08	@	.14
Oil soluble aniline, red	lb.		@	
orange	lb.		@	
Oximony	lb.	.16	@	
Para toner	lb.	1.40	@	
Red excelsior			@	
Rubber-makers' red (four shades)	lb.	3.50	@	
purple	lb.	2.50	@	
Spanish natural	lb.	.04	@	.05
Toluidine toner	lb.	2.50	@	2.75
Venetian	lb.	.02½	@	.05
Vermilion, American	lb.	.25	@	.30
permanent	lb.		@	
English quicksilver	lb.	.85	@	.87

White

Albalith	lb.	.06	@	.06½
Aluminum bronze	lb.	.55	@	.60
Lithopone, Beckton white	lb.	.06	@	.06½
Lithopone, domestic (factory)	lb.	.06	@	.06½
Ponolith (carloads, factory)	lb.		@	
Rubber-makers' white	lb.		@	

Zinc oxide, American Horse Head (factory):		C.L.		L.C.L.
Special	lb.	.08	@	.08½
XX red	lb.	.07½	@	.08
French process, Florence brand (factory):				
White seal	lb.	.11	@	.11¼
Green seal	lb.	.09¾	@	.10¼
Red seal	lb.	.08¾	@	.09¼
White seal	lb.	.11	@	.11¼
Azo (factory):				
ZZZ (lead free)	lb.	.07½	@	.08
ZZ (under 5% leaded)	lb.	.07¼	@	.07¾
Z (8-10% leaded)	lb.	.07	@	.07½

Yellow

Arsenic, yellow sulphide	lb.	1.00	@	
Cadmium, sulphide	lb.	1.25	@	1.50
Chrome, light and medium	lb.	.18	@	
C. P.	lb.	.20	@	
Dipped goods	lb.	1.00	@	
Ochre, domestic	lb.	.02½	@	.03½
imported	lb.	.03½	@	.04
Oil soluble aniline	lb.		@	
Rubber makers' yellow	lb.	3.50	@	
Zinc yellow	lb.	.33½	@	

Compounding Ingredients

Aluminum flake (carloads)	ton	25.00	@	29.45
hydrate, light	lb.	.22	@	.25
Ammonium carbonate (lump)	lb.	.13	@	.13½
Asbestine	ton	20.00	@	25.00
Barium, carbonate	ton	50.00	@	60.00
dust	ton	100.00	@	
Barytes, pure white (carloads)	ton	23.90	@	28.00
off color (carloads)	ton	20.00	@	
uniform floated (carloads)	ton	23.90	@	
Basofor	lb.	.04½	@	
Beta-naphthol	lb.	.33	@	
Blanc fixe	lb.	.03½	@	.04
Bone ash	lb.		@	
Carrara filler (factory)	ton	18.00	@	
Chalk, precipitated, extra light (f. o. b. factory)	lb.	$0.03½	@	$0.04½
heavy (f. o. b. factory)	lb.	.02½	@	.03¼
China, clay, Dixie	ton	22.00	@	32.00
Blue Ridge	ton	22.00	@	32.00
domestic, lump (f. o. b. factory)	ton	7.50	@	9.00
imported, lump	ton	16.00	@	24.00
Cotton linters, clean mill run	lb.	.03½	@	
Fossil flour (powdered)	ton	60.00	@	
(bolted)	ton	65.00	@	
Glue, high grade	lb.	.30	@	.40
medium	lb.	.22	@	.28
low grade	lb.	.15	@	.18
Graphite, flake	lb.	.10	@	
amorphous	lb.	.05	@	
Ground glass FF. (bbls.)	lb.		@	
Infusorial earth (powdered)	ton	60.00	@	
(bolted)	ton	65.00	@	
Liquid rubber	lb.	.15	@	
Mica, powdered	lb.	.08	@	.15
Phenanthrene	lb.		@	
Pumice stone, powdered	lb.	.03	@	.05
Rotten stone, powdered (bbls.)	lb.	.02½	@	.04½
Rubber paste	lb.		@	
Silica, aluminum	ton	20.00	@	22.50
gold bond	ton	25.00	@	
silver bond	ton	22.00	@	
Soap bark, cut	lb.	.10	@	.10½
Soapstone, powdered-gray (carloads)	ton	12.00	@	
Starch, powdered corn	cwt.	1.88	@	2.16
Talc, soapstone	ton	22.50	@	
Terra blanche	ton	20.50	@	22.50
Tripoli flour, air-floated, cream or rose (factory)	ton	27.00	@	
white (factory)	ton	30.00	@	
Tyre-lith	ton		@	
Whiting, Alba	cwt.	15.00	@	18.00
Columbia	cwt.		@	
commercial (carloads)	cwt.	1.05	@	1.15
Danish	ton	18.00	@	
English cliffstone (carloads)	cwt.	1.55	@	2.00
gilders	cwt.	1.20	@	1.35
Paris, white, American (carloads)	cwt.	1.25	@	1.35
Quaker	ton	13.00	@	15.00
Superfine	ton		@	
Wood pulp, imported	ton		@	
XXX (f. o. b. factory)	ton	30.00	@	
X (f. o. b. factory)	ton	27.50	@	
Wood flour	ton		@	

Mineral Rubber

		C.L.		L.C.L.
Elateron (factory)	ton		@	
Gilsonite	ton	70.00	@	
Genasco (factory)	ton	50.00	@	52.00
Hard hydrocarbon	ton	35.00	@	45.00
Soft hydrocarbon	ton	33.00	@	40.00
320/340 M. P. hydrocarbon (factory)	ton	47.50	@	50.00
300/310 M. P. hydrocarbon (factory)	ton	42.50	@	45.00
Pioneer, M. R.	ton	55.00	@	
Raven M. R.	ton		@	
Robertson, M. R. (factory)	ton	52.50	@	55.00
Rubrax (factory)	ton	50.00	@	
States "A"	ton	45.00	@	
No. 1	ton	40.20	@	
Synpro, granulated, M. R. (factory)	ton	54.50	@	64.50

Oils

Avoilas compound (bbls.)	lb.	.14	@	
Castor, No. 1, U. S. P.	lb.	.12	@	
No. 3, U. S. P.	lb.	.11	@	
Corn (bbls.)	lb.	.09¼	@	.09½
refined	lb.	.11	@	.11¼
Cotton (bbls. factory)	lb.	.10	@	
Glycerine (98 per cent)	lb.	.14½	@	.15
Halowax	gal.	.25	@	.27
Linseed, raw, domestic	gal.	.70	@	
imported	gal.		@	
Linseed compound	gal.		@	
Palmoline	lb.		@	
Palm, niger	lb.	.05¾	@	.06
Peanut (bbls. factory)	lb.	.11½	@	.12
Petrolatum, standard	lb.	.06	@	.08
Petrolatum, sticky	lb.	.08	@	.10
Pine, steam distilled	gal.	1.07	@	1.30
Rapeseed, refined (factory)	lb.	.12	@	
blown	lb.	.13½	@	
Rosin	gal.	.44	@	.45
Synpro	gal.	.38	@	.90
Soya bean (bbls.)	lb.	.08¾	@	.09
Tar	gal.	.28	@	.33

Resins and Pitches

Cantella gum	lb.		@	
Cumar resin, hard	lb.	.09	@	.12
soft	lb.	.09	@	.12
Tar, retort	bbl.	10.40	@	11.00
kiln	bbl.	10.00	@	10.50
pine retort	bbl.		@	
Pitch, Burgundy	lb.	.05	@	
coal tar	lb.	.01½	@	
pine tar	lb.	.03	@	
ponto	lb.	.05	@	
Rosin, K (bbl.)	280 lbs.	6.70	@	
strained (bbls.)	280 lbs.	6.10	@	
Shellac, fine orange	lb.	.75	@	.80

Solvents

Acetone (98.99 per cent drums [6.62 lbs. per gal.])	lb.	$0.12½ @	$0.13½
Benzol (90%, drums [7.21 lbs. per gal.])	gal.	.25 @	.31
pure (drums)	gal.	.27 @	.42
Carbon bisulphide (drums [10.81 lbs. per gal.])	lb.	.07 @	.07½
tetrachloride (drums [13.28 lbs. per gal.])	lb.	.11 @	.14
Paracymene (factory)	gal.	1.00 @	
Motor gasoline (steel bbls.)	gal.	.27 @	
73@76 degrees (steel bbls.)	gal.	@	
68@70 degrees (steel bbls.)	gal.	@	
Naphtha, V. M. & P. (steel bbls.)	gal.	.24 @	
solvent (drums extra)	gal.	.27 @	
Toluol, pure (7.21 lbs. per gal.)	gal.	.28 @	.34
Turpentine, spirits	gal.	.82 @	
wood	gal.	.80 @	
Xylol, pure (7.21 lbs. per gal.)	gal.	.40 @	.43
commercial	gal.	.28 @	.33

Substitutes

Black	lb.	.07 @	.14
Brown	lb.	.10 @	.15
White	lb.	.08 @	.16
Brown factice	lb.	.07 @	.14½
White factice	lb.	$0.09	@ $0.15½
Paragol, soft and medium	cwt.	@	
hard	cwt.	@	

Vulcanizing Ingredients

Lead, black hyposulphite (black hypo)	lb.	.35 @	
Sulphur chloride (jugs)	lb.	.20 @	
(drums)	lb.	.08 @	
Sulphur, flour, Brooklyn brand (carloads)	cwt.	@	
Brooklyn brand (less carload)	cwt.	@	
Bergenport brand (bbls.)	cwt.	2.55 @	
(bags)	cwt.	2.30 @	
Light 100% pure (bbls.)	cwt.	2.60 @	3.15
(bags)	cwt.	2.35 @	2.90
Superfine 99½% pure (carloads, bbls)	cwt.	2.40 @	2.90
(bags)	cwt.	2.00 @	2.50

(See also Colors—Antimony).

Waxes

Wax, beeswax, white, commercial	lb.	.55 @	
ceresine, white	lb.	.12 @	
carnauba	lb.	.16 @	
Montan	lb.	.07 @	
ozokerite, black	lb.	.25 @	
green	lb.	.25 @	
paraffine	lb.	.25 @	
sweet wax	lb.	.12 @	

OCEAN RATES FROM NEW YORK ON TIRES, TUBES, MECHANICAL GOODS, CLOTHING, FOOTWEAR AND DRUGGISTS' SUNDRIES[1]

(Same rates apply from other Atlantic ports where service is available.)

Country and Port	Rates Cu. Ft.	Rates 100 lbs.
Africa		
AFRICA, EAST COAST—		
Beira	..	*$26.00
Plus landing charges $0.30 per ton.		
Kilendini	..	*30.40
Delagoa Bay, Lourenco Marques	..	*25.40
Mauritius	..	*31.00
NORTH COAST—		
All ports	..	*22.00
EGYPT—		
Alexandria	..	*22.00
SOUTH COAST—		
Algoa Bay	..	*23.60
Capetown	..	*23.00
East London	..	*24.20
Port Natal	..	*24.80
WEST COAST—		
Accra-Lagos, Secondi, Buruttu	..	*30.00
Dakar, Freetown	..	*28.00
Boma, Matadi	..	*32.00
Asia		
CHINA—		
Hongkong, Shanghai	..	*23.00
INDIA—		
All direct ports	..	*21.00
Madras, Rangoon	..	*23.00
JAPAN—		
All direct ports	..	*23.00
JAVA—		
All ports	..	*21.00
MANCHURIA—		
Dalny	..	*24.00
PHILIPPINES—		
Manila	..	*23.00
STRAITS SETTLEMENTS—		
Singapore, Penang	..	*21.00
SYRIA—		
Beyrout	..	*24.00
Central America		
COSTA RICA—		
Port Limón	$.64	1.31
MEXICO—		
Tampico	.52½	1.05
Plus 2½c. per 100 lbs. bar dues.		
Vera Cruz, Puerto Mexico	.52½	1.05
PANAMA—		
Colon	.32	.64
Plus $1 per ton transfer charge.		
Panama	.37	.74
Plus $1 per ton transfer charge.		
SALVADOR—		
La Libertad	.79	1.42
Europe		
BELGIUM—		
Antwerp	.40	.75
BRITISH ISLES—		
All ports	.40	.75
Except rubber belting	.50	1.00
CANARY ISLANDS—		
Las Palmas	..	*25.00
DENMARK—		
Copenhagen	.55	1.00
ESTHONIA—		
Reval	.75	1.50
FINLAND—		
Helsingfors	.75	1.50
FRANCE—		
All Atlantic ports	.40	.75
Marseilles	..	*20.00
GERMANY—		
Hamburg, Bremen	.45	.82½
Danzig	.50	.90
GREECE—		
All ports	..	*22.00
HOLLAND—		
Rotterdam	.40	.75
Amsterdam	.40	.75
ITALY—		
Direct ports	.50	1.00
Fiume, Trieste, Venice	..	*26.00
NORWAY—		
All ports	.55	1.00
PORTUGAL—		
Lisbon	..	*20.00
Oporto	..	*25.00
RUMANIA—		
All ports	..	*25.00
SPAIN—		
All ports	..	*20.00
Gibraltar	.65	1.20
SWEDEN—		
Malmö, Stockholm, Gothenburg	.50	1.00
South America		
ARGENTINA—		
Buenos Aires	..	*20.00
Rosario	..	*27.50
BRAZIL—		
Rio de Janeiro	..	*22.50
Santos	..	*20.00
Bahia	..	*24.00
Pernambuco	..	*23.50
CHILE—		
All ports	.74	1.32
COLOMBIA—		
Cartagena, Puerto Colombia, Santa Marta	.51	1.12
Plus government charges.		
Buenaventura—		
(via direct steamer)	1.03	1.84
(via transshipment)	.98	1.75
ECUADOR—		
Guayaquil—		
(via direct steamer)	.74	1.32
(via transshipment)	.70	1.25
PERU—		
Callao, Mollendo	.74	1.32
URUGUAY—		
Montevideo	..	*20.00
VENEZUELA—		
La Guayra	.40	.65
Plus 4c per 100 kilos landing charge.		
Oceania		
AUSTRALIA—		
All ports	..	*25.00
NEW ZEALAND—		
All ports	..	*25.00
West Indies		
BERMUDA—		
Hamilton	.37	.75
Grenada, St. Croix, St. Thomas, St. Kitts	.50	1.00
Port of Spain	.40	.75
CUBA—		
Havana	.47	.94
Plus 30c per 100 lbs. Cuban wharfage and handling charges.		
Santiago	.59	1.18
Cienfuegos	.61	1.21
CURAÇAO—		
Curaçao	.30	.65
JAMAICA—		
Kingston	.42	84
PORTO RICO—		
San Juan	.28	.69
All other ports	.31	.75
Less 10% plus 1c per cu. ft. or 2½c per 100 lbs. landing charge at destination.		
SANTO DOMINGO—		
Santo Domingo	.51	.91

[1]Compiled by Austin Baldwin & Co., Inc., foreign freight contractors, 44 Whitehall street, New York, N. Y.

*Rate figured on ton of 40 cubic feet or 2,240 lbs.

International Textile Exposition

The International Textile Exposition, under the auspices of the Textile Exhibitors Association, Inc., and in conjunction with the semi-annual meeting of the National Association of Cotton Manufacturers, was held in Mechanics Building, Boston, Massachusetts, October 31 to November 5, 1921. Much interest was shown by a large attendance of textile experts and manufacturers from all over the world, and the general public took full advantage of the rare chance to learn something of this wonderful industry. Over 300 exhibitors, occupying the entire building, comprised the largest and most varied exposition of operative textile machinery ever grouped together for public exhibition, affording an unexampled opportunity for examination and comparison of the latest and best methods of cotton and woolen textile manufacture in all its branches. Finished products, machinery, factory equipment and supplies, processes and instruments for test and regulation were included, many of which were of interest to rubber goods manufacturers or to makers of textiles for the rubber trade. Some $2,000,000 worth of machinery, in full view of the visitors, converted raw materials into finished goods of many kinds.

At the various sessions of the semi-annual meeting of the National Association of Cotton Manufacturers, held at the Copley-Plaza Hotel, November 2 and 3, papers were read and open discussions conducted by textile experts devoted to technical and trade matters, especially research and foreign trade.

Notable Exhibits of General Interest

An educational exhibit of the National Research Council visualized the importance of the chemical industry to the nation. Its central feature was a topographical model representing a group of chemical industries depending upon coal, salt, sulphur, and atmospheric nitrogen for their raw materials. The model showed how these materials are made available to the more important chemical industries through intermediate plants and the part which industrial alcohol plays in the general scheme of things. The relationship existing between pharmaceuticals, war gases, explosives and other major divisions of organic chemical industry was brought out. Simple and comprehensive charts showed the relation between war and peace-time application of these chemicals and the ease with which production can be planned with reference to industrial prosperity or national defence.

The Bureau of Standards was represented by an exhibit of textile testing machines and methods, while the United States Bureau of Foreign and Domestic Commerce demonstrated its increased facilities for serving the manufacturer, merchant and exporter. A big display of cloth samples collected from textile markets in all parts of the world by representatives of the bureau was on exhibition.

Exhibits of Interest to Rubber Manufacturers

Among the exhibits of particular interest to rubber goods manufacturers were the following:

ALLIS-CHALMERS MANUFACTURING CO., Milwaukee, Wisconsin. Pictures and literature descriptive of its special induction motors using alternating or direct current.

AMERICAN HARD RUBBER CO., New York, N. Y. Hard rubber centrifugal pumps and an assortment of hard rubber pipe and fittings.

H. W. BUTTERWORTH & SONS CO., Philadelphia, Pennsylvania. Fabric-finishing machinery of all kinds, notably cell dryers.

CARRIER ENGINEERING CORPORATION, Newark, New Jersey. Air-conditioning equipment in operation under automatic control, for producing favorable weather conditions in factories.

CURTIS & MARBLE MACHINE CO., Worcester, Massachusetts. Projectograph display of cloth brushing, inspecting, measuring and folding machines.

E. I. DUPONT DE NEMOURS & CO., Wilmington, Delaware. Dyestuffs in the production of which this company has gained great prominence.

LINK-BELT CO., Chicago, Illinois. Silent chain drive exhibit showing the wide application of this type of transmission and its increasing use in the textile industry. Many of the machines in operation throughout the exhibition were driven by Link-Belt silent roller chains.

MASON REGULATOR CO., Dorchester, Massachusetts. Reducing valves for accurate control of steam pressure.

MORSE CHAIN CO., Ithaca, New York. Samples of the full line of well-known Morse rocker joint silent chain drives for textile machinery.

THE NATIONAL ANILINE & CHEMICAL CO., New York, N. Y. A large and imposing display of coal tar dyes and intermediates, showing the latest advances in American dyestuffs produced by this well-known firm.

HENRY L. SCOTT & CO., Providence, Rhode Island. A complete display of the well-known hand and motor driven testing machines for rubber, yarn and fabric.

TEXTILE FINISHING MACHINERY CO., Providence, Rhode Island. Cloth breaker and photo frames.

WESTINGHOUSE ELECTRIC & MANUFACTURING CO., East Pittsburgh, Pennsylvania. A notable exhibit of dynamos, mill and yard lighting, individual motor drives, both alternating and direct current, together with safety switches and other control equipment, especially designed for the textile industry.

Other Exhibits

Other exhibitors whose displays attracted the attention of rubber men were the following:

AMERICAN TOOL & MACHINE CO., Boston, Massachusetts, power transmission machinery and cement churns; AMERICAN WRINGER CO., Woonsocket, Rhode Island, rolls and rubber goods; CROMPTON & KNOWLES LOOM WORKS, Providence, Rhode Island, and Worcester, Massachusetts, fabric looms; DODGE SALES & ENGINEERING CO., Boston, Massachusetts, pulleys and hangers; THE FOXBORO CO., INC., Foxboro, Massachusetts, indicating and recording instruments and automatic temperature controllers; GENERAL ELECTRIC CO., Schenectady, New York, photographic views of important installations shown by automatic lantern slide machines; HYATT ROLLER BEARING CO., Worcester, Massachusetts, bearings, line shafts, looms, spinners, twisters, cards and pickers; PARKS-CRAMER CO., Fitchburg, Massachusetts, air compressors, filter tanks, conditioning apparatus; PARKS & WOOLSON MACHINE CO., Springfield, Vermont, cloth measuring, finishing, trademarking and inspecting machinery; SACO-LOWELL SHOPS, Boston, Massachusetts, cards, strippers, pickers, twisters and spinning frames; SARCO CO., INC., New York, N. Y., temperature regulators, thermostatic steam traps and thermometers; ALFRED SUTER, New York, N. Y., testing apparatus for yarn and cloth; C. J. TAGLIABUE MANUFACTURING CO., Brooklyn, New York, humidity, temperature and time-temperature controllers, thermometers, hydrometers and oil testing instruments; TAYLOR INSTRUMENT COMPANIES, Rochester, New York, recording and index thermometers, hydrometers, pressure regulators, pyrometers, etc.; TOLEDO SCALE CO., Toledo, Ohio, automatic scales and weighing machines.

A. S. T. M. ASSUMES WORK OF JOINT RUBBER INSULATION COMMITTEE

The joint Rubber Insulation Committee, having completed its essential work on the "Procedure for the Analysis of Rubber Compound," which has been printed as an appendix to the "Tentative Specifications for Insulated Wire and Cable: 30 Per Cent Hevea Rubber," has requested the American Society for Testing Materials to take over any further work that may be necessary in connection with the subject. In accordance with this invitation, the Society has placed the matter in the hands of Committee D-11 on Rubber Products.

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